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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 10] [1921

XLVI.—A CONTRIBUTION TO THE FLORA OF NORTHERN NIGERIA.

PLANTS COLLECTED ON THE BAUCHI PLATEAU BY MR. H. V. LELY.

J. HUTCHINSON.

In the account of the visit of the Assistant Director to the Cameroons and Nigeria (*Kew. Bull.* 1921, 225–243), it was noted that Mr. H. V. Lely, Forestry Officer, Naraguta, Northern Nigeria, was investigating the flora of this botanically little known region, and had forwarded to Kew a number of herbarium specimens. Mr. Lely has fortunately been able to make several further contributions, and has already brought together a very good representative collection, especially of the herbaceous vegetation. His activities have been confined to that part of Northern Nigeria described by Falconer* as "the mysterious Bauchi plateau, the home of innumerable pagan tribes, whose precipitous walls on the South and West long marked the limit between the known and the unknown."

This interesting plateau, which rises to a height of 4000–4500 ft. above the sea, is veritably a *terra nova* to the botanical collector, and, as might be expected, there are amongst Mr. Lely's plants many new species and quite a number of new records of considerable phytogeographic interest. For our knowledge of the flora of many parts of the interior of Tropical Africa we have hitherto had to depend mainly on explorers and hunters, whose visits were necessarily at the most favourable time of the year, and to most of whom plant collecting was a haphazard and minor consideration, attended by a considerable amount of extra labour and baggage. So that an extensive collection of plants from a resident in the interior, and that resident a forest officer, is particularly valuable and sure to yield interesting results.

As Mr. Lely himself writes, the majority of the plants in Northern Nigeria, owing to the excessive dryness of the climate,

* J. D. Falconer, Geology and Geography of Northern Nigeria, p. 3 (1911).

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pass through their life cycle at a great rate, especially the herbaceous vegetation, and in order to obtain a good representative collection it is necessary to carry on field work for a whole season. Up to the present Mr. Lely has collected nearly six hundred specimens* and there is promise of more to follow. The fact that these represent about four hundred species of plants shows the care the collector has taken in order to avoid duplication of specimens.

The following list of species indicates the large number of interesting new records for the flora of Northern Nigeria and their previously known distribution. It should be noted that the flora as represented by these examples is much more closely related with that of the East African plateau, the Zambesi Basin, and Angola than with the flora of Upper Guinea as a whole.

Species now recorded from Northern Nigeria.	Previously known only from :—
Polygala Volkensii, Gürke	Nyasaland, Rhodesia.
Monotes caloneurus, Gilg	S.E. Sudan, Angola.
Kosteletzkya Büttneri, Gürke	S.E. Congo, Angola.
Cissus crotalarioides, Planch.	Jurland, Nyasaland.
Anaphrenium pulcherrimum, Schweinf.	East and S.E. Tropical Africa.
Tephrosia radicans, Welw.	N.W. Rhodesia, Angola.
Desmodium dimorphum, Welw.	Angola to Usambara.
Adenodolichos macrothyrsus, Harms.	Jur- and Bongoland.
Eriosema holophyllum, Bak. f.	Niamniamland.
Eriosema sparsiflorum, Bak. f.	Jurland.
Eriosema griseum, Bak.	Angola and Bongoland.
Eriosema cordifolium, Hochst.	Abyssinia.
Osbeckia postpluvialis, Gilg	Jurland.
Diplolophium abyssinicum, Bth. & Hk. f.	Abyssinia to Uganda.
Sabicea brevipes, Wernham	Togoland.
Pentanisia Schweinfurthii, Hiern.	E. Africa.
Fadogia obovata, N.E. Br.	N. Nyasaland and N.W. Rhodesia.
Gutenbergia Ruppellii, Sch. Bip.	Abyssinia and Kenya Colony.
Vernonia oocephala, Bak.	N. Nyasaland.
Senecio Hochstetteri, Sch. Bip.	Abyssinia and East Afr. Mts.
Picris humilis, DC.	Senegal.
Kanahia glaberrima, N.E. Br.	East Africa and Angola.
Sopubia parviflora, Engl.	Jurland and Angola.
Utricularia tribracteata, Hochst.	Abyssinia and Somaliland.
Utricularia rigida, Benj.	Sierra Leone, W. French Guinea.

* When this paper was nearly completed a further hundred specimens from the eastern parts of the Bauchi province were received from Mr. Lely. These are not included in the present paper.

Species now recorded from Northern Nigeria.	Previously known only from :—
Utricularia micropetala, Sm.	Sierra Leone.
Lepidagathis mollis, T. Ands.	Uganda.
Geniosporum paludosum, Bak.	E. Trop. Africa.
Thesium leucanthum, Gilg	Angola.
Angraecum Kotschyanum, Reichb. f.	Nile Land to Nyasaland.
Brachycorythis pubescens, Harv.	Kenya Colony to Natal and in Angola.
Habenaria Mannii, Kk. f.	Cameroon Mtn.
Aristea angolensis, Bak.	Angola.
Chlorophytum pusillum, Schweinf.	Jurland.

The greater portion of Mr. Lely's collection is included in the present paper, but a few specimens still remain for more critical examination and comparison with other herbaria. Amongst these are a number of striking Orchids, mostly species of the genus *Habenaria*, which is so largely represented in the Tropical African Flora. I have, however, ventured to describe two species of Orchids which appear to be new, namely, *Eulophia propinqua* and *Satyrium nigericum*, the latter genus not having been recorded previously from Upper Guinea. The ground orchids of Northern Nigeria, and of the Bauchi plateau in particular, are worthy of special study, and further contributions of them from Mr. Lely would probably provide material for a separate paper. It would, however, be necessary to compare them critically with the numerous new species described in Berlin from the Cameroons, and with Chevalier's collections in Paris, few of which are represented in this country. In the case of these two new Orchids, and, indeed, with nearly all the *new species* of the collection, the affinity is again decidedly with plants native of East and South-East Tropical Africa, and not with Upper Guinea.

For the preliminary determination of many of the specimens enumerated in the following list I am much indebted to Miss K. Pearce and Mr. E. G. Dunk, whilst Dr. Stapf, Mr. C. H. Wright and Mr. W. B. Turrill have brought their special knowledge to bear on the *Lentibulariaceae*, Ferns and *Acanthaceae* respectively, and Mr. Turrill has taken great care in the determination of the Ceropegias, including the striking *C. Ledermannii* figured on p. 388. For the more artistic text figures (Nos. 3, 6, 7, 10) I am greatly indebted to Mr. A. Kellett.

The following abbreviations have been used :—

F.T.A. = Flora of Tropical Africa.

Holland = Holland, Useful Plants of Nigeria, Kew Bull. Additional Series IX.

Only occasionally do Mr. Lely's notes refer to economic properties; but as many of the plants enumerated are recorded

as having such, I have thought it sufficient to refer to Holland's work rather than repeat his published statements. All the plants mentioned were collected by Mr. Lely during the present year (1921) on the Bauchi Plateau, the various localities and date of collection being clearly indicated. Where no distribution is given it should be understood that the species is common throughout Tropical Africa.

ANONACEAE.

Artabotrys nigericus, *Hutchinson*, sp. nov.; valde affinis *A. nitido*, Engl. (sp. afr. orient.), sed inflorescentiis et floribus minoribus differt.

Frutex 5–6·5 m. altus; rami flexuosi, lenticellis numerosis instructi, glabri. *Folia* elliptica vel oblongo-elliptica, breviter et obtuse acuminata, basi obtusa vel breviter cuneata, 8–12 cm. longa, 3–5 cm. lata, tenuiter coriacea, utrinque glabra et laxe reticulata, supra nitidula; costa utrinque verruculosa; nervi laterales utrinsecus circiter 8, a costa sub angulo 75° abeuntes, marginem versus furcati et ramosissimi, venis laxis utrinque conspicuis; petioli 4–5 mm. longi, parce pubescentes. *Inflorescentia* brevissima, uncinata, vix 1·5 cm. longa; pedicelli curvati, 4 mm. longi, appresse pubescentes; bracteae ovatae, 2·5 mm. longae, extra hirsutae. *Sepala* triangularia, subacuta, rigida, 3 mm. longa, basi 4 mm. lata, extra parce puberula. *Petala* subaequalia, e basi cucullata lineari-teretia, fere 2 cm. longa, medio 1·75 mm. crassa. *Stamina* 1·25 mm. longa, apice plana, rotundata, 1 mm. diametro. *Carpella* 1·5 mm. longa, glabra. *Fructus* non visus.

NORTHERN NIGERIA. Naraguta, 17 August, shrub 15–20 ft. on river banks, flowers yellow, scented, *H. V. Lely*, No. 541.

MENISPERMACEAE.

Cissampelos mucronata, *Rich.*; F.T.A. i. 45; Holland, 52 (under *C. Pareira*); Diels, Monogr. Menisp. 300.

Naraguta, climbing 2–3 ft., male flowers green, No. 15.

Distrib.—Senegal to South Africa.

PAPAVERACEAE.

Argemone mexicana, *Linn.*; F.T.A. i. 54; Holland, 53.

Mamu, 2500 ft., 11 May, "yellow poppy," 2 ft., No. 160.

Hausa name "Kaya Geiva" (Elephant's Thorn).

An introduced weed, common in the tropics and subtropics.

CRUCIFERAE.

Lepidium sativum, *Linn.*; F.T.A. i. 69.

Baradau, 3000 ft., in fruit 3 May, 18 ins. high, flowers yellow, No. 87.

CAPPARIDACEAE.

Cleome monophylla, *Linn.*; F.T.A. i. 76.

Baradau, 3000 ft., 3 May, 6–12 ins., pale pink flower, No. 88.

Neill's Valley, 2 miles east of Gov. Station, Naraguta, 15 June, No. 273.

Gynandropsis pentaphylla, *DC.*; F.T.A. i. 82; Holland, 54.

Mamu, 2500 ft., 11 May, 2 ft. high, used as an ear medicine and the leaves for muja (sauce), No. 158.

BIXACEAE.

Cochlospermum tinctorium, *Rich.*; F.T.A. 113; Holland, 57.

Naraguta, 3–4 ins., flowers bright yellow, on the ground, No. 4.

See notes in *Kew Bull.* 1921, No. 6, pp. 240, 245.

POLYGALACEAE.

Polygala Volkensii, Gürke in Engler, Pflanzenw. Ost-Afr. C. 234 (1895).

Naraguta, 20 June and 1 August, herb about 2 ft. 6 ins. high, slender raceme of green and mauve flowers, Nos. 275 and 472. Collected also by Dr. J. M. Dalziel (No. 60) in grassy meadows, Zungeru.

Distrib.—Hitherto only recorded from East Africa, from the Nyasa Highlands (Tanganyika Territory) south to the Mazoe district of Rhodesia (F. Eyles 609). The Nigerian plant seems to be identical.

Polygala micrantha, *G. & P.*; F.T.A. i. 131; Chodat Monogr. Polygalac. 217 (1891).

Plains between Hepham and Ropp, 4600 ft.; 4 ins. high, spikes of mauve flowers, No. 355.

Distrib.—Senegambia to the Chari Region.

Polygala arenaria, *Willd.*; F.T.A. i. 128; Chodat, Monogr. Polygalac. 337, t. xxvii. fig. 35–36.

Naraguta, 8 Aug., small herb amongst rocks, 3–4 ins. high, dorsal petal and wings salmon pink, keel purple, crested, No. 527.

Polygala Bäikiei, *Chodat*, Monogr. Polygalac. 334 (1891).

Naraguta, 5 Aug., amongst rocks, herb about 5 ft. high, with single raceme of mauve-pink flowers.

Hausa "Jina Jina," No. 487.

Apparently endemic to Northern Nigeria.

Polygala acicularis, *Oliv.*; F.T.A. i. 132; Chodat, Monogr. Polygalac. 368.

Plains between Hepham and Ropp, 4600 ft., 5 July; 2 ft. high, petals cream coloured with fine purple veins, keel blue or purple, No. 373.

Distrib.—West Africa from N. Nigeria to Angola, and in Uganda.

HYPERICACEAE.

Haronga paniculata, *Lodd. ex Steud.* Nom. ed. II. i. 722.

Arungana paniculata, Pers. Syn. Pl. ii. 91 (1807).

Haronga madagascariensis, Choisy Prodr. Monog. Hyper. 34 (1821); F.T.A. i. 160; Holland, 62.

Naraguta, 5 Aug., robust shrub 5–6 ft., on rocks on stream banks, flowers greenish white, orange coloured sap, Hausa "Alibiba rafi," No. 493.

Distrib.—One of the most widely spread of African shrubs, also in the Mascarene Islands.

PORTULACACEAE.

Portulaca oleracea, *Linn.*; F.T.A. i. 148; Holland, 61. Taura, 6 May; 6–12 ins., leaves fleshy, flowers yellow in clusters, No. 122.

DIPTEROCARPACEAE.

Monotes caloneurus, *Gilg* in Engl. Bot. Jahrb. xxviii. 136 (1901).

Naraguta, on rocks 8 Aug.; flowers green, No. 517.

Distrib.—South Eastern Sudan and in Angola.

MALVACEAE.

Sida linifolia, *Cav.*; F.T.A. i. 179.

Naraguta, 20 June, petals yellow with red basal blotch, 15 ins. high, No. 279.

There is evidently colour variation in the flowers, for Dalziel and Parsons describe them as white with purple centre.

Distrib.—Throughout West Africa to Angola and also in the West Indies and the north east coast of S. America.

Sida spinosa, *Linn.*; F.T.A. i. 180.

Lemme, 2600 ft., 1–2 ft., No. 140.

Sida cordifolia, *Linn.*; F.T.A. i. 181.

Panyam, 4500 ft., 17 July, flowers yellow, ½ in. in diameter, No. 437.

Urena lobata, *Linn.*; F.T.A. i. 189; Holland 68.

Ringim Mukr, 2500 ft., 22 May, flowers bright pink, on stream banks, 2–3 ft. high, No. 218.

Kosteletzkya Büttneri, *Gürke ex Buettn.* in Verh. Bot. Ver. Brand. xxxi. 92 (1889).

Panyam, 4500 ft., 11 July; 2–3 ft., white flowers with pink veins, 1¼ ins. in diam., No. 416.

Distrib.—Hitherto known only from Angola to the South Eastern Belgian Congo.

Hibiscus articulatus, *Hochst.*; F.T.A. i. 200.

Nabardo, 2300 ft., 20 May, flowers yellow changing to pink, petals twisting up closely after pollination, not seen open, No. 206.

Apparently a rather variable species with a woody rhizome; distribution rather scattered and mainly in East Africa, from the Eastern Sudan and Abyssinia to the Zambesi.

STERCULIACEAE.

Melochia melissifolia, var. **bracteosa**, *K. Schum.* Monogr. Afr. Sterculiac. 43 (1900).

Plains between Hepham and Ropp, 4600 ft., 5 July; stems decumbent, 1–3 ft., purple, woody, leaves edged with red, and venation red below, No. 370.

Distrib.—Upper Guinea and Central Africa generally.

Waltheria americana, *Linn.*; K. Schum. Monogr. Afr. Stercul. 45 (1900); Holland, 95.

Bauchi, 2200 ft., 2 ft. high, flowers yellow, No. 171.

Naraguta, 4000 ft., 30 June, No. 339.

TILIACEAE.

Grewia mollis, *Juss.*; F.T.A., i. 248; Holland, 106.

Naratga, 3 ft. high, flowers yellow, No. 74.

Distrib.—From Sierra Leone across North Tropical Africa to the Eastern Sudan and Uganda.

Grewia bicolor, *Juss.*; F.T.A. i. 248 (under *G. salvifolia*, Heyne); Holland, 105.

Mamu, 2500 ft., 11 May, a large tree 40 ft. high on hill tops, flowers yellow. Hausa name "Markin Dutsi" (or the rock growing *Anogeissus*), No. 161.

Distrib.—From Senegal to the Niger, and in North East Trop. Africa and the Zambesi delta.

Triumfetta lepidota, *K. Schum.*; Sprague and Hutch. in Journ. Linn. Soc. Bot. xxxix. 245 (1909).

Nabardo, 2300 ft., 20 May, large strong, woody perennial plant up to 5 ft., flowers bright yellow, No. 217.

Distrib.—Across the savannah country from the Gold Coast to Niamniamland.

Triumfetta dubia, *De Wild.*; Sprague and Hutch. in Journ. Linn. Soc. Bot. xxxix. 259 (1909).

Naraguta, 23 June, 12–18 ins., small greenish brown hirsute flowers, No. 334; 17 Aug., No. 535.

Distrib.—From Togoland to Tanganyika Territory.

Triumfetta tomentosa, *Bojer*; Sprague and Hutch. in Journ. Linn. Soc. Bot. xxxix. 260 (1909).

Naraguta, 8 Aug., grass lands, herb 2–3 ft., branching tough woody stems, leaves velvety, flowers orange yellow, No. 511.

Distrib.—Tropical Africa from Nigeria southwards.

Corchorus olitorius, *Linn.*; F.T.A. i. 262; Holland, 114.

Mongu, 4300 ft., 10 July, 1 ft. high, No. 401.

Corchorus trilocularis, *Linn.*; F.T.A. i. 262.

Takwara, 3200 ft., 4 May, 1 ft. high, flowers yellow, No. 100.

Distrib.—Rare in Upper Guinea, but common in most other parts of Tropical Africa.

ZYGOPHYLLACEAE.

Tribulus terrestris, *Linn.*; F.T.A. i. 283.

Takwara, 3200 ft., 4 May, trailing 1 ft. long, flowers yellow, No. 99.

OXALIDACEAE.

Biophytum Apodiscias, *Edgew. & Hook. f.*; F.T.A. i. 297 (as *Oxalis sensitiva*, partly).

Naraguta, 20 June, corolla pale apricot, No. 277.

Oxalis corniculata, *Linn.*; F.T.A. i. 296.

Plains between Hepham and Ropp, 4600 ft., 5 July, decumbent, 4–6 ins., flowers yellow, No. 354.

CELASTRACEAE.

Gymnosporia senegalensis, *Loes.*, forma **coriacea,** *Loes.* in Engl. Bot. Jahrb. xvii. 542 (1893), (sub *Celastrus senegalensis*, Lam.; F.T.A. i. 361).

Naraguta, 1 ft. high, flowers greenish white, No. 68.

VITACEAE.

Ampelocissus bombycina, *Planch.*; Gilg & Brandt, Vitac. Afric. in Engl. Bot. Jahrb. xlvi. 431 (1912).

Vitis bombycina, Baker in Fl. Trop. Afr. i. 399.

Rinjim Mukr, 2500 ft., 22 May, climber, umbel of red flowers, No. 223.

Distrib.—Also in Togoland and the Gold Coast.

Cissus corylifolia, *Planch.*; Gilg & Brandt, Vitac. Afric. in Engl. Bot. Jahrb. xlvi. 473 (1912).

Nabardo, 2300 ft., 20 May, 2–2½ ft., umbel of reddish flowers, leaf attaining nearly 1 ft. across, No. 207; found also at Abinsi, 30 April, 1912, by *Dr. J. M. Dalziel* (No. 673).

Distrib.—Originally collected by Barter in Nupe, and evidently confined to Northern Nigeria.

Cissus rufescens, *G. & P.*; Gilg & Brandt, Vitac. Afr. in Engl. Bot. Jahrb. xlvi. 473 (1912).

Pankshin, 5100 ft., 14 July; climbing and creeping, 10 ft., flowers small, red. No. 434.

Distrib.—Senegambia to the Cameroons and Lake Chad region.

Cissus Lelyi, *Hutchinson*, sp. nov.; affinis *C. Schweinfurthii*, Planch., sed petiolis longioribus foliorum marginibus et alabastris haud glandulosis differt.

Herba scandens 2 m. alta vel ultra; caulis circiter 3·5 mm. crassus, dense strigilloso-tomentosus et pilis rigidis apice glandulosis parce indutus; internodii 5–5·5 cm. longi. *Cirrhi* oppositifolii, ad 10 cm. longi, superne contorti, albido-pubescentes. *Folia* digitatim 5-foliolata, breviter petiolata, foliolis oblanceolatis acutis basi attenuatis 5–9 cm. longis 1–2 cm. latis chartaceis acute dentatis nervis et venis utrinque pubescentibus; petioli 1–1·5 cm. longi, pubescentes; petioluli 3–5 mm. longi; stipulae lineari-oblongae, acute acuminatae, usque ad 1·5 cm. longae, 3 mm. latae, extra strigilloso-pubescentes, intra glabrae et striatae. *Inflorescentia* terminalis, cymosa, circiter 6 cm. expansa; pedunculus ad 6·5 cm. longus, pubescens et parce glandulosopilosus; pedicelli 2–2·5 mm. longi, dense pubescentes. *Calyx* subnullus, extra pubescens. *Corolla* urceolata, medio contracta apice truncata, 2·5–3 mm. longa, 1·75 mm. diametro, appresse pubescens. *Stamina* plerumque 4, erecta, inter lobos disci inserta; filamenta 1·75 mm. longa; antherae rotundatae, 0·65 mm. longae. *Ovarium* ovoideum, glabrum; stylus 1 mm. longus.

Northern Nigeria. Top of Zaranda Mountain, 5800 ft., climbing 6 ft. or more, flowers greenish white, 18 May 1921, *H. V. Lely* No. 194.

Cissus crotalarioides, *Planch.*; Gilg & Brandt, Vitac. Afr. in Engl. Bot. Jahrb. xlvi. 498 (1912).

Naraguta, 3 ft. high, No. 72.

Nabardo, 2300 ft., 20 May, 2–3 ft. high, umbel of greenish flowers, No. 210.

Distrib.—Also in Jurland, and Nyasaland.

Cissus adenocaulis, *Steud.*; Gilg & Brandt, Vitac. Afr. in Engl. Bot. Jahrb. xlvi. 516 (1912).

Tilde Filani, 3300 ft., 24 May, climbing 10 ft., umbel of red flowers, No. 224.

Distrib.—Very widely spread in Tropical Africa.

Cissus rubiginosa, *Welw.*; Gilg & Brandt, Vitac. Afr. in Engl. Bot. Jahrb. xlvi. 475 (1912).

Mongu, 4300 ft., 8 July; 2 ft. high, flowers small, white, No. 388.

Distrib.—N. Nigeria, Angola, and the Northern Lake Region of East Africa.

SAPINDACEAE.

Cardiospermum Halicacabum, *Linn.*; F.T.A. i. 417.
Panyam, 4500 ft., 17 July; climber 6 ft. high, small white flowers, fruit a three-lobed bladder which "pops," No. 436.

Paullinia pinnata, *Linn.*; F.T.A. i. 419.
Zelau, 3200 ft., climbing 5–8 ft., flowers white, No. 111.
Naraguta, 23 June, 2–3 ft., No. 330.
Common throughout Tropical Africa, the Mascarenes and in Tropical America.

Schmidelia africana, *DC.*; F.T.A. i. 421.
Mongu, 4300 ft., 8 July: woody shrub 5–6 ft. high, ♂ flowers green, No. 389.
Distrib.—West Africa generally.

Schmidelia affinis, *G. & P.*; F.T.A. i. 422.
Vodni, 4600 ft., 13 July, shrub 5 ft., ♂ flowers white, sweet scented, No. 428.

Schmidelia magica, *Baker* in Fl. Trop. Afr. i. 423.
Zaranda Filani, stream sides, 19 May, shrub 4 ft., spikes of small, white, sweet scented flowers, No. 187.
Recorded from "Guinea," from Oloke Meji (*Foster* 96), and from Nupe (*Barter* 1648).

ANACARDIACEAE.

Anaphrenium pulcherrimum, *Schweinf.*; Engl. Monogr. Anacard. 356. *Rhus pulcherrima*, Oliv. Fl. Trop. Afr. i. 436.
Naraguta, 1–3 ft., flowers white or pale yellow, fruits red, Nos. 25, 71.
Plains between Hepham and Ropp, 4600 ft., 5 July, flowers pale purple, No. 351.
Occurs also in East and South East Tropical Africa.

CONNARACEAE.

Rourea gudguana, *Gilg* in Engl. Bot. Jahrb. xiv. 323.
Naraguta, shrub 10–12 ft., flowers white, No. 73.
Distributed from the hinterland of Sierra Leone to Dar Fertit in the Eastern Sudan.

LEGUMINOSAE.

Subfamily **Papilionaceae.**

Crotalaria graminicola, *Taub.* ex *Baker f.* in Journ. Linn. Soc. Bot. xlii. 291 (1914).
Naraguta, 4000 ft.; 6–12 ins. high, flowers orange-yellow, Nos. 53, 238.
Distrib.—Senegambia to the Cameroons.

Crotalaria lachnosema, *Stapf* in Kew Bull. 1910, 329; Baker f. in Journ. Linn. Soc. Bot. xlii. 323.

Naraguta, large bushy plant 3 ft. high, flowers yellow with orange veins, No. 51.

Ropp, 4600 ft., 19 July, No. 455.

Distrib.—Liberia to the Cameroons.

Crotalaria crepitans, *Hutchinson*, sp. nov.; affinis *C. rectae*, Steud., sed bracteolis medio pedicellorum insertis, calyce extra breviter sericeo-pubescente differt.

Herba erecta 1 m. alta; caulis robustus, pluricostatus, circiter 6 mm. crassus, minute et crebre pubescens, sicco pallide cinereus, internodiis 2–3 cm. longis. *Folia* trifoliolata; petioli 2–2·5 cm. longi, parce pubescentes; stipulae lineari-subulatae, acutae, circiter 6 mm. longae, appresse pubescentes; foliola obovato-oblanceolata, apice rotundata et conspicue hirsuto-mucronata, basi cuneata, 4–6 cm. longa, 1·5–2·5 cm. lata, supra viridia et dense fungoso-maculata, infra pallida et breviter albido- pubescentia; nervi laterales utrinsecus 8–9 infra crassi et prominentes marginem versus conjuncti. *Racemi* usque ad 25 cm. longi; pedicelli 5–7 mm. longi, albo-pubescentes; bracteae lineari-subulatae, acutissimae, 6–8 mm. longae, 2 mm. latae, extra pubescentes; bracteolae 2 medio pedicellorum insertae, subulatae, 3 mm. longae. *Flores* flavi, brunneo-purpureo striati. *Calyx* 1·3 cm. longus; lobi lanceolato-deltoidei, acuti, circiter 7 mm. longi, basi 4 mm. lati, parce pubescentes. *Vexillum* glabrum, oblongo-obovatum, 1·5 cm. longum, 8 mm. latum, usque 4 mm. longum. *Alae* et carina apice firme conniventes, circiter 1·5 cm. longae. *Ovarium* glabrum, nigrum. *Fructus* immaturus 3 cm. longus, niger.

Northern Nigeria. Plains between Hepham and Ropp, 4600 ft., 5 July, 3 ft. high, flowers yellow, standard petal striped brown-purple at the base, wings also at the base and on the back edges, pods rattle when ripe, *H. V. Lely* No. 378.

The upper surface of the leaves of this species are everywhere closely infested with the fungus *Parodiella perisporioides*, kindly identified by Miss E. M. Wakefield. It gives the leaves a densely black mottled appearance.

Crotalaria naragutensis, *Hutchinson*, sp. nov.; affinis *C. Pechuelianae*, Schinz, sed calyce longiore lobis multo angustioribus, carina longe acuminata differt.

Frutex robustus, ramosus, 1·5–2 m. altus; rami costati, dense et molliter cinereo-tomentelli. *Folia* trifoliolata, laxe disposita; petioli 2·5–3 cm. longi, tomentelli, stipulae caducae, subulatae, 4 mm. longae; foliola obovata, late emarginata et mucronulata, basi cuneata, terminalia lateralibus paullo majora, 2–4·5 cm. longa, 1·5–2·5 cm. lata, supra glabra, infra minute appresse pubescentia; nervi laterales utrinsecus 6–8, a costa sub angulo 45° abeuntes, marginem versus evanidi, venis vix evolutis; petioluli circiter 1·5 mm. longi. *Racemi* terminales,

longe pedunculati, usque ad 20 cm. longi; rhachis conspicue angularis, cinereo-tomentella; pedicelli 3–4 mm. longi; bracteae caducae, filiformes, 7 mm. longae. *Alabastra* curvato-rostrata, sericeo-tomentosa. *Calyx* campanulatus, appresse tomentosus; tubus 3·5 mm. longus; lobi subulato-lanceolati, acuti, ad 6 mm. longi. *Petala* flava, glabra; carina 1·3 cm. longa, fere semilunaria, rostrata; alae oblongae, vix 1 cm. longae. *Ovarium* supra dense hirsutum. *Fructus* ignotus.

NORTHERN NIGERIA. Naraguta, amongst rocks near water, 5 Aug., 1921, woody robust branching plant about 4–6 ft. high, Hausa "Bekkin Bi-rana," *H. V. Lely* No. 490.

Crotalaria cylindrocarpa, *DC.*; F.T.A. ii. 40; Baker f. in Journ. Linn. Soc. Bot. xlii. 414 (1914).

Naraguta, grasslands, 2 Aug.; herb with woody stems about 1 ft. high, flowers yellow also in fruit, No. 480.

Distrib.—Senegambia and Northern Nigeria.

Indigofera Dalzielii, *Hutchinson* in Kew Bull. 1921, 246.

Bichikki, 2200 ft., 19 May, No. 188.

Distrib.—An endemic Northern Nigerian species.

Indigofera dendroides, *Jacq.*; F.T.A. ii. 100; E. G. Baker in Journ. Bot. 1903, 245.

Naraguta, 4000 ft., 30 June, 1 ft. high, flowers red-brown, No. 337.

Distrib.—Senegambia to East Africa and in Angola.

Indigofera stenophylla, *G. & P.*; F.T.A. ii. 83; E. G. Baker in Journ. Bot. 1903, 260.

Panyam, 4500 ft., 11 July, racemes of bright pink flowers, No. 408.

Distrib.—North Tropical Africa.

Indigofera hirsuta, *Linn.*; F.T.A. ii. 88; E. G. Baker in Journ. Bot. 1903, 265; Holland, 191.

Naraguta, 8 Aug., herb. 1–2 ft. high, amongst rocks, flowers pink, sepals covered with soft black hairs, inflorescence spicate, appearing to be smoky coloured, No. 510.

Indigofera macrophylla, *Schumach.*; F.T.A. ii. 100; E. G. Baker in Journ. Bot. 1903, 330.

Neill's Valley, 2 miles east of Naraguta Gov. Station, 15 June, No. 261.

Distrib.—Senegambia to S. Nigeria and in Angola.

Tephrosia densiflora, *Hook. f.*; F.T.A. ii. 114.

Naraguta, on stream banks amongst rocks, 5 Aug.; robust shrubby plant about 6 ft., large mauve flowers appearing one at a time, back of standard petal grey-brown, No. 488.

First collected by Vogel near Mt. Patti, and subsequently by Barter at Jebba, but not gathered since then until its rediscovery by Mr. Lely. Evidently a species endemic to the Niger Basin.

Tephrosia Anselli, *Hook. f.*; F.T.A. ii. 115.

Neill's Valley, 2 miles East of Government Station, Naraguta; stems 2–3 ft. high, strong and wiry, branched, flowers mauve, No. 270.

Naraguta, 8 Aug., herb 3 ft. high, amongst rocks, flowers deep crimson, No. 529.

Distrib.—Togoland to the Belgian Congo.

Tephrosia radicans, *Welw.*; F.T.A. ii. 121.

Vodni, 4600 ft., 13 July, procumbent, flowers pink, No. 422.

Distrib.—Hitherto known only from Angola and North West Rhodesia.

Sesbania pachycarpa, *DC.*; Phillips & Hutch. in Bothalia, 1. 50.

Naraguta, 8 Aug., robust plant 5–6 ft. high, on rocks in open country, leaflets closing up at night, flowers yellow, the back of the standard and the keel thickly mottled with black, No. 534.

Distrib.—North Tropical Africa generally, and in Angola.

Smithia speciosa, *Hutchinson*, sp. nov.; affinis *S. strigosae*, Benth., sed robustior, floribus multo majoribus, bracteolis latioribus et vix cuspidato-acuminatis, petalis latioribus differt.

Fig. 1. *Smithia speciosa*, Hutchinson. 1, part of leafy shoot; 2 leaflet; 3, flower; 4, pair of bracteoles; 5, upper lip of calyx; 6, lower lip of same; 7, standard; 8, wing petal; 9, keel petal; 10, stamens; 11, pistil.

Frutex robustus, 1·3–1·75 m. altus; caules numerosi, erecti, ramosi; ramuli teretes, pilis gracilibus mollibus basi pustulatis tomentosi, inferne stipulis persistentibus ornati. *Folia* fasciculata, pinnata, usque ad 1·5 cm. longa, breviter petiolata; stipulae basi petiolo adnatae, oblique lanceolatae, acutissime acuminatae, circiter 1 cm. longae, basi circiter 3·5 mm. latae, conspicue nervosae, ciliatae; foliola oblongo-elliptica, subacuta, basi rotundata vel obtusa, 4–5 mm. longa, 1·5–2 mm. lata, coriacea, parce ciliata, pellucide punctata, basi circiter 5-nervia.

Racemi laterales, densi, circiter 2·5 cm. longi, conspicue bracteati; bracteae ovato-orbiculares, rigide cuspidato-acuminatae, circiter 8 mm. longae, et 4 mm. latae, nervosae, ciliatae; bracteae oblique ovatae, acuminatae, 7 mm. longae, 4 mm. latae; pedicelli 3 mm. longi, pubescentes. *Calyx* bilabiatus, ciliatus, labio superiore ad medium bilobato 1 cm. longo, 5 mm. lato, labio inferiore profunde trilobato lobis lateralibus planis intermedio cymbiforme 1·3 cm. longo ciliato-apiculato. *Petala* coerulea; vexillum obovatum, late emarginatum, apice ciliato-mucronatum, 1·4 cm. longum, 1 cm. latum; alae oblique obovato-oblongae, superne parve ciliatae, 1·2 cm. longae et 4 mm. latae; carina 1·4 cm. longa, apice minute denticulata. *Ovarium* 2-ovulatum, sericeo-tomentosum, stylo gracile inferne laxe piloso. *Fructus* ignotus.

Northern Nigeria. Naraguta, in open grass and amongst rocks, 2 Aug., 1921, perennial about 4–5 ft. high, branching from numerous stems, flowers bright prussian blue, *H. V. Lely* No. 478.

This is the first species of *Smithia* recorded from Nigeria, and it finds its nearest relative in the Mascarene and South East Tropical African (Nyasaland and Rhodesia) *Smithia strigosa*, Benth. Details of the floral structure are shown in figure 1.

Stylosanthes erecta, *P. Beauv.*; F.T.A. ii. 156.
Bichikki, 2000 ft., 17 May, ½–2 ft., No. 178.

Zornia diphylla, *Pers.*; F.T.A. ii. 158; Holland, 206.
Nabardo, 2300 ft., 20 May, 6–12 ins., flowers greenish, No. 205.

Desmodium dimorphum, *Welw.*; F.T.A. ii. 161.
Naraguta, amongst rocks, 8 Aug.; herb 2 ft. high, flowers mauve, No. 513.

Distrib.—From Angola across the Zambesi Basin into Usambara; this is the first record from Upper Guinea.

Desmodium gangeticum, *DC.*, F.T.A. ii. 161.
Baradau, 3000 ft., 3 May, 1–1½ ft. high, flowers pink, and in fruit, No. 85.

Desmodium lasiocarpum, *DC.*; F.T.A. ii. 162.
Naraguta, in grasslands, 20 Aug.; woody plant 3 ft. high, with pale flowers, No. 546.

Desmodium ascendens, *DC.*; F.T.A. ii. 162.
Naraguta, 18 ins., flowers red, No. 18.
Lemme, 2600 ft., 7 May, No. 147.

Distrib.—West Africa generally and in East Tropical Africa; occurs also in the West Indies and Eastern Brazil.

Desmodium mauritianum, *DC.*; F.T.A. ii. 164.
Plains between Hepham and Ropp, 4600 ft., 5 July, 9 ins. high, flowers dark red, No. 359.

Alysicarpus Zeyheri, *Harv.*; F.T.A. ii. 170.

Lemme, 2600 ft., 7 May, flowers brownish, fruits articulated, not wrinkled, No. 135.

Mongu, 4300 ft., 8 July, flowers red, and fruits, No. 394.

Distributed East and Southward to the Transvaal.

There are several species of *Alysicarpus* in Northern Nigeria, and as they are mainly determined by fruit characters it is necessary that fruits should be collected where possible. *A. vaginalis*, DC., with a very lax inflorescence and turgid, slightly moniliform fruit, often black when quite ripe, is according to Dalziel, called "Gadiggi," and is a food for horses, sheep, goats, etc. It is common in pastures. *A. Zeyheri*, Harv., first recorded here from Upper Guinea, has rather flattened smooth (not wrinkled) pods arranged on an elongated axis. In the absence of fruits it is difficult to distinguish from a third species, occurring in Nigeria, *A. rugosus*, DC., with very dry, chaffy bracts, rather densely arranged and strongly and transversely wrinkled fruits, also described by Mr. Lamb as a valuable fodder and an ubiquitous weed of arable land in Northern Nigeria. It is evidently not distinguished by the vernacular from *A. vaginalis*. The species of this genus need study in the field, especially in regard to the form and variation of the fruit.

Canavalia africana, *Dunn*, mss.

Mongu, 4300 ft., 8 July; climbing 15 ft., flowers pink, pods 12–18 ins., used for rattles, Hausa "Borran Kashi," No. 387.

This is an undescribed species which will be dealt with by Mr. S. T. Dunn in a forthcoming revision of the genus *Canavalia*.

Vigna longissima, *Hutchinson*, sp. nov.; species foliis et pedicellis longissimis valde distincta. (*See* p. 368.)

Herba gracilis, 15–20 cm. alta, basi ramosa; caules graciles, primum prostrati, demum ascendentes, laxe pilosi, sulcati. *Folia* pauca, longissime petiolata, trifoliolata; petioli usque ad 14 cm. longi, sulcati, glabri; stipulae ovato-lanceolatae, acute acuminatae, circiter 8 mm. longae et 2·5 mm. latae, prominenter nervosae, parce ciliatae; foliola elongato-linearia, acuta, 6–18 cm. longa, 2–8 mm. lata, trinervia, fere glabra, utrinque prominenter reticulata, nervis infra prominentibus. *Flores* solitarii, pallide coerulei; pedicelli longissimi, usque ad 15 cm., superne parce pubescentes. *Calyx* oblongo-campanulatus, 8 mm. longus, extra prominenter nervosus et parce pilosus; tubus 3·5 mm. longus, lobis posticis supra medium connatis, anticis e basi triangulare linearibus circiter 5 mm. longis. *Vexillum* latissime rotundatum, late emarginatum et mucronatum, 1·8 cm. longum, 2·5 cm. latum, appendicibus binis hamatis. *Carinae* petala valde incurva, superne firme connata, *Ovarium* villosum; stylus incurvatus, superne unilatere villosus. *Fructus* non visus.

Northern Nigeria. Plains between Hepham and Ropp, 4600 ft., 5 July, 1921, *H. V. Lely* No. 360.

Dolichos biflorus, *Linn.*; F.T.A. ii. 210; Holland, 234.

Plains between Hepham and Ropp, 4600 ft., 5 July; procumbent, 2 ft. long, flowers pale yellow in pairs, No. 352.

Naraguta, 29 July; trailing procumbent plant, 3–4 ft. long, many cream coloured flowers; standard petal with purple raised lines at the base, No. 470.

Dolichos Lelyi, *Hutchinson* in *Kew Bull.* 1921, 247.

Naraguta, in clumps, No. 44. Nabardo, 2300 ft., 20 May, Nos. 208, 215. (*See* p. 369.)

Adenodolichos macrothyrsus, *Harms* in Engl. Bot. Jahrb. xxxiii. 180.

Mongu, 4300 ft., 8 July, main stem single, 3–10 ft., standard greenish, wings pink, keel white, No. 398.

Known only from Northern Nigeria and Jur and Bongoland in the South-eastern Sudan.

Fig. 2. *Vigna longissima*, Hutchinson. 1, whole plant, reduced; 2, calyx and pistil; 3, stamens; 4, anther; 5, wing petal; 6, keel petal; 7, standard; 8, portion of leaf showing lower surface. (*See* p. 367.)

Sphenostylis Schweinfurthii, *Harms* in Engl. Bot. Jahrb. xxvi. 309.

Ropp, 4600 ft., 19 July, 4 ft. high, stems woody and branching, flowers greenish yellow, No. 454.

Distrib.—From Northern Nigeria through the Chari region to Abyssinia.

Eriosema holophyllum, *Bak. f.* in Journ. Bot. 1895, 99.

Naraguta, 4000 ft., 30 May, 18 ins. high, loose short spike of white flowers, No. 240.

Previously known only by a fruiting specimen collected by Schweinfurth at Gumba, Niamniamland, in the South Eastern

Sudan. The two plants are identical. I give here a description of the flowers which have been collected for the first time by Mr. Lely :—

Racemi axillares et terminales, simplices vel leviter ramosi, usque ad 11 cm. longi; pedunculus 8–9 cm. longus, erectus, dense appresse pilosi; pedicelli 3–4 mm. longi, pubescentes; bracteae lineari-filiformes, 5 mm. longae, molliter pilosae; bracteolae geminatae, lineares, calycis tubo dimidio breviores. *Calycis* tubus anguste campanulatus, 2·5 mm. longus, pilosus, lobis duobus posticis subconnatis triangularibus, tribus anticis lanceolatis acutis circiter 2·5 mm. longis piloso-ciliatis. *Corolla* calyce leviter longior, alba; vexillum late oblongum, breviter unguiculatum, circiter 6 mm. longum et 3 mm. latum, aliis et carina leviter breviores. *Stamina* inclusa, 4 mm. longa. *Ovarium* fusiforme, 2·5 mm. longum, stylo breve curvato, stigmate capitato parvo.

Fig. 3. *Dolichos Lelyi*, Hutchinson. 1, flowering and fruiting shoot; 2, calyx; 3, vexillum; 4, pistil; 5, seed. (*See* p. 368.)

Eriosema cajanoides, *Hook. f.*; F.T.A. ii. 227; Baker f. in Journ. Bot. 1895, 144.

Nabardo, 2300 ft., 20 May; woody perennial, stem 1 inch thick, 6 ft. high, flowers bright yellow, No. 212.

Naraguta, 3 ft., No. 78.

Eriosema sparsiflorum, *Baker f.* in Journ. Bot. 1895, 144.
Naraguta, 4000 ft., 18 ins. high, flowers orange-red, No. 19; 30 June, No. 336.
Previously known only by the type specimen collected by Schweinfurth in Djurland, in the South Eastern Sudan.

Eriosema griseum, *Baker*; F.T.A., ii. 228; Baker f. in Journ. Bot. 1895, 227.
Naraguta, 7 May, 9 ins. high, flowers yellow, erect, No. 8.
Distrib.—Also in Angola and Bongoland (S.E. Sudan).

Eriosema glomeratum, *Hook. f.*; F.T.A. ii. 228; Baker f. in Journ. Bot. 1895, 228.
Mongu, 4300 ft., 8 July; 12 ins. high, heads of yellow and red flowers, No. 393.
Distrib.—Widely spread in North Tropical Africa.

Eriosema cordifolium, *Hochst.*; F.T.A. ii. 224; Baker f. in Journ. Bot. 1895, 230.
Naraguta, in grass country, 2 Aug.; herb about 9 ins. high, with heads of yellow flowers, petals with brown veins, No. 482.
This is the first record for this plant from anywhere outside Abyssinia, nearly 2,000 miles away, and it is a striking instance of the close affinity between the high level floras of East and West Africa.

Swartzia madagascariensis, *Desv.*; F.T.A. ii. 257; Holland, 248.
Fiskin Mata, 3000 ft., 23 Apr.; tree 15–20 ft., single petal white, No. 104.
Distrib.—A widely spread African tree, also in the Mascarenes.

Subfamily II. **Caesalpiniaceae.**

Cassia goratensis, *Fresen.*; F.T.A. ii. 273.
Vodni, 4600 ft., 13 July; woody, 2–6 ft. high, flowers yellow, No. 424.

Cassia Tora, *Linn.*; F.T.A. ii. 275; Holland, 260.
Panyam, 4500 ft., 11 July, 2–4 ft. high, No. 417.

Cassia obovata, *Collad*; F.T.A. ii. 277; Holland, 258.
Bichikki, 2200 ft., 17 May, flowers and fruit, No. 174.

Cassia mimosoides, *Linn.*; F.T.A. ii. 280; Holland, 258—*sensu lato.*
Naraguta, 17 Aug.; stout plant up to 6 ft., the leaflets closing up after sunset, flowers yellow, No. 538.
Distrib.—A common tropical weed, but probably represented in some regions by more than one distinct species.

Subfamily III. **Mimosaceae.**

Mimosa asperata, *Linn.*; F.T.A. ii. 335; Holland, 287.
Lemme, 2600 ft., large thorny shrub 12–15 ft. high, common on river banks, round clusters of mauve flowers, pods green and brown, hairy, No. 141.

SAXIFRAGACEAE.

Vahlia oldenlandioides, *Roxb.*; F.T.A. ii. 384.
Takwara, 3200 ft., 4 May; 4–6 ins. high, minute pale pink flowers, No. 106.

DROSERACEAE.

Drosera indica, *Linn.*; F.T.A. ii. 402.
Naraguta, 8 Aug.; plants 1–2 ins. high with small pink flowers, leaves fly-catching, No. 531.

COMBRETACEAE.

Combretum herbaceum, *Don*; F.T.A. ii. 433; Engl. Monogr. Afr. Combret. 67; Hutch. in Kew Bull. 1921, 248.
Naraguta, 1–2 ft. high, flowers orange, fruits bright red, winged, No. 9.
Distrib.—Savannah region from Sierra Leone to the Eastern Chari.

MYRTACEAE.

Eugenia owariensis, *Beauv.*; F.T.A. ii. 438; Holland, 320.
Naraguta, shrub 12 ft. high, flowers white, No. 82.

MELASTOMACEAE.

Osbeckia postpluvialis, *Gilg*, Monogr. Afr. Melastomac. 6.
Ropp, 4600 ft., 19 July; 12 ins. high, flowers mauve, No. 447.
Known only from Northern Nigeria and Djurland in the Eastern Sudan, the latter being the type locality.

Dissotis Irvingiana, *Hook.*; F.T.A. ii. 453; Gilg, Monogr. Afr. Melastomac. 20; Holland, 321.
Naraguta, 23 June; 2 ft. 6 ins. high, whole plant closely covered with red hairs, flowers purple, No. 333.
Distrib.—Gold Coast to Northern Nigeria.

Dissotis graminicola, *Hutchinson*, sp. nov.; affinis *D. Perkinsiae*, Gilg, sed ex descriptione caule terete, foliis basi distincte cordatis supra dense setuloso-tomentosis, floribus paucis speciosis ovario apice pilis setosis concretis coronata differt. (*See* p. 372.)

Herba circiter 4·5 dm. alta, basi lignosa; caulis dense foliatus, teres, breviter tomentosus, basin versus circiter 6 mm. diametro, internodiis 2–2·5 cm. longis. *Folia* ovata, subacuta, basi cordata, 4–8 cm. longa, 2–4 cm. lata, coriacea, integra, supra dense setuloso-tomentosa, infra molliter tomentella, basi circiter 9-nervia, nervis ascendentibus subparallelis supra leviter impressis, infra prominentibus, nervis tertiariis transversis crebris prominulis; petioli 1 cm. longi, teretes, tomentosi. *Flores* speciosi, terminales, conferti, purpureo-coerulei. *Alabastra* anguste oblongo-ovoideum, circiter 2 cm. longum, ubique dense setosum. *Calycis tubus* ellipsoideo-campanulatus, circiter 1·3 cm.

longus et diametro, setis fasciculatis stipitatis dense indutus, lobi 5, oblique oblongi, apice pilis longis fasciculatis ornati, circiter 1 cm. longi, extra molliter appresse hirsuti. *Petala* 5, late obovata, intra basin breviter unguiculatam parce pilosa, cetera glabra, 3–3·5 cm. longa et 2·5 cm. lata. *Stamina* 10, valde inaequalia, 3 cm. et 4·5 cm. longa; antherae circiter 1·5 cm. longae, marginibus undulatis. *Ovarium* ovoideo-globosum, 5 mm. longum, densissime villosum, apice pilis setosis inferne concretis circiter 4 mm. longis coronatum; stylus 3 cm. longus, glaber, apice truncatus.

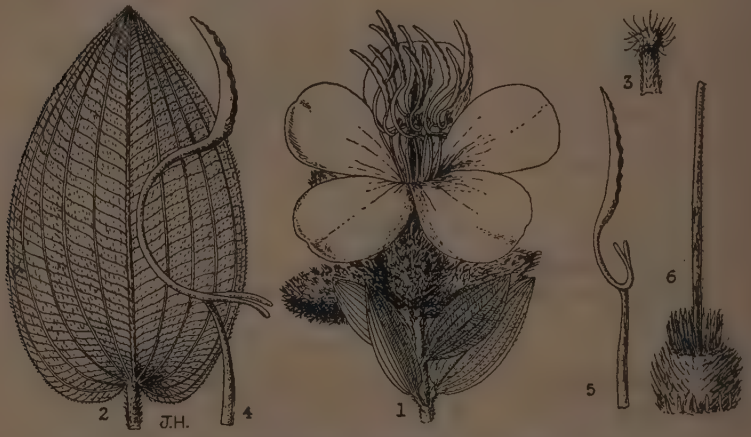

Fig. 4. *Dissotis graminicola*, Hutchinson. 1, top of flowering shoot × ½ 2, leaf showing under surface × ½; 3, appendage of calyx; 4, long, 5, short stamen; 6, pistil; 3-6 enlarged. (*See* p. 371.)

Northern Nigeria. Naraguta, in wet grass lands, 20 Aug., 1921, woody herb about 18 ins. high, flowers bluish-purple, *H. V. Lely* No. 543.

A very handsome and distinct species of *Dissotis* with flowers 6–7 cm. in diameter.

Dissotis cinerascens, *Hutchinson*, sp. nov., foliis oblongo-lanceolatis utrinque glabris parce ciliolatis, floribus terminalibus solitariis calycis tubo glabro distincta.

Herba cinerea, 4·5 dm. alta; caules parce ramosi, erecti, glabri, internodiis 5–7 cm. longi. *Folia* opposita, sessilia, oblongo-lanceolata vel lineari-oblonga, obtusa vel subacuta, basi lata et subamplexicaulia, 3–8 cm. longa, 0·6–1·3 cm. lata, parce setuloso-ciliata, supra opaca, infra cinerea, glabra, obscure trinervia. *Flores* solitarii, terminales, 4–5-meri (fide Lely); pedicelli 1 cm. longi, superne incrassati, glabri. *Calycis tubus* campanulatus, 1 cm. longus, striatus, glaber; segmenta lineari-lanceolata, acuta, 1·5 cm. longa, 3·5 mm. lata, minute et parce ciliolata, extra glabra, superne roseo suffusa. *Petala* late obovata, circiter 2·5 cm. longa et fere 2 cm. lata, glabra. *Stamina* 10, exserta, antheris 5 flavis basi breviter gibbosis, 5 rubescentibus

basi longe productis, circiter 8 mm. longis. *Ovarium* globosum, glabrum, apice squamis dentato-setosis coronatum. *Fructus* immaturus calycis segmentis persistentibus accrescentibus coronatus.

Northern Nigeria. Neill's Valley, 2 miles east of Government Station, Naraguta, 15 June, 1921, 1½ ft. high, petals mauve, *H. V. Lely* No. 259.

Dissotis Lambii, *Hutchinson* in Kew Bull. 1916, 230.

Naraguta, 20 June; 18–24 ins. high, No. 285, 4 Aug., about 5 ft. high, mauve flowers about 3½ ins. in diameter, No. 484.

Previously collected by Mr. Lamb at Kaduna.

Antherotoma Naudinii, *Hook. f.*; Gilg, Monogr. Afr. Melastomac. 9, t. 1, F.

Naraguta, 17 Aug.; small herb about 10 ins. high, 4 mauve petals, No. 536.

Widely distributed in Tropical Africa and Madagascar.

Onagraceae.

Jussiaea diffusa, *Forsk.*; F.T.A. ii. 488.

Bauchi, 2200 ft., in wet marshy places, 13 May, 1 ft. high flowers yellow, No. 172.

Jussiaea villosa, *Lam.*; F.T.A. ii. 489.

Naraguta, decumbent in damp stream bed, flowers yellow, No. 28.

Lemme, 2600 ft., 7 May, No. 93.

Ficoidaceae.

Glinus lotoides, *Linn.*, var. **virens** (*Oliv.*); F.T.A. ii. 590 (*Mollugo Glinus*).

Takwara, wet places, 3200 ft., 4 May; spreading 2 ft., petals pale mauve with dark central line, No. 101.

Distrib.—Nigeria and Angola.

Mollugo nudicaulis, *Lam.*; F.T.A. ii. 591.

Bichikki, 2200 ft., 17 May; 3–6 ins. high, flowers white, No. 181.

Cucurbitaceae.

Momordica foetida, *Schum.*; F.T.A. ii. (*M. Morkorra*, *A. Rich.*).

Vodni, 4600 ft., 13 July, 6 ft., corolla snow white, sepals with black knobs, fruit a large 2–3 ins. oval green berry with orange protuberances, No. 423.

Umbelliferae.

Hydrocotyle asiatica, *Linn.*; F.T.A. iii. 6; Hutch. in *Kew Bull.* 1921, 248.

Naraguta, 20 June; decumbent 2–3 ft., flowers small, red, on short stout stalks, No. 281.

Widely spread in the tropics of the Old World.

Diplolophium abyssinicum, *Benth. & Hk. f.*; F.T.A. iii. 17.
Naraguta, in long grass, 6 Aug., robust perennial Umbellifer, up to 8 or 9 ft., stem streaked with crimson, flowers greenish white, No. 499.
Distrib.—Previously known only from East Africa, from Abyssinia to the Mau Plateau, Uganda.

Pycnocycla occidentalis, *Hutchinson*, sp. nov.; affinis *P. glaucae*, Lindl., sed pedunculis dense pubescentibus, umbellis et bracteis multo majoribus differt.

Herba basi lignosa usque ad 6 dm. alta; caulis basi foliis reductis membranaceis imbricatis indutus, dense pubescens. *Folia* longe petiolata; pinnatipartita, circiter 15 cm. longa, segmentis acicularibus sulcatis acutis rigidis glabris ultimis circiter 2 cm. longis; petioli plerumque circiter 9 cm. longi, subteretes, sulcati. *Flores* polygami in umbellum compositum multiradiatum circiter 5·5 cm. diametro dispositi; involucri bracteae circiter 12, lineari-lanceolatae, acute acuminatae, 1·3 cm. longae, pilis patulis vel subreflexis densissime tomentosae; involucelli bracteae exteriores similes sed paullo breviores et filiformi-acuminatae, interiores multo reductae; pedunculi ultimi 1 cm. longi, villoso-tomentosi. *Calycis lobi* subulati, pubescentes. *Petala* exteriora linearia, 5–6 mm. longa, apice inaequaliter bidentata extra parce puberula. *Flos* foemina dense tomentosa.

Northern Nigeria. Ropp, 4600 ft., 19 July, 1921, 1–2 ft. high, flowers whitish, *H. V. Lely* No. 450.

This is the first record of the genus *Pycnocycla* from Upper Guinea. The species is closely related to *P. glauca*, Lindl., which occurs in Abyssinia and Somaliland and also in Central and N.W. India. The genus is otherwise confined to Asia Minor, mainly in Persia, and is a distinct desert type.

Rubiaceae.

Hymenodictyon floribundum, *B. L. Robinson* in Proc. Amer. Acad. xlv. 404 (1910); F.T.A. iii. 42 (*H. Kurria*, Hochst.)
Neill's Valley, 2 miles east of Naraguta Gov. Station, 15 June; small stout rock shrub, 1–3 ft., spikes of numerous dark red flowers, No. 266.
Distrib.—Eastward to Abyssinia, in Nyasaland and Angola.

Pentas globifera, *Hutchinson*, sp. nov.; affinis *P. verticillatae*, K. Schum. (sp. afr. orient.), sed caulibus satis dense crispato-pilosis, calycibus dense confertis, corollae lobis minoribus differt.

Herba erecta, circiter 45 cm. alta; caulis simplex, laxe foliatus, circiter 5 mm. crassus, breviter strigoso-pubescens, internodiis 4–5 cm. longis. *Folia* ternatim verticillata, obovato-oblanceolata, acuta, basi sensim angustata, 5–8 cm. longa, 2–3 cm. lata, chartacea, utrinque breviter et laxe pubescentia; nervi laterales utrinsecus circiter 7, arcuato-ascendentes, supra leviter prominuli, infra prominentes, nervis tertiariis cum lateral-

ibus subparallelis; stipulae tripartitae, 7–8 mm. longae, segmentis lineari-subulatis parce pubescentibus. *Inflorescentia* terminalis, capitata, circiter 8 cm. expansa; bracteae foliaceae. *Flores* albi, sessiles, 6–7 cm. longi. *Calyx* inaequaliter 5-partitus, segmentis lanceolatis acute acuminatis dorso carinatis parce pubescentibus 6–7 mm. longis. *Corollae tubus* 5·5 cm. longus, superne leviter latior, extra pilis brevibus patulis hirsutus, intra superne dense villosus; lobi 5, oblongo-lineares, obtusi, 7 mm. longi, 2 mm. lati, extra leviter pubescentes, marginibus incurvis. *Stamina* inclusa, 1 cm. infra apicem corollae tubi inserta; antherae 5 mm. longae, basi breviter bilobatae. *Stylus* 1·2 cm. exsertus, glaber, stigmate bilobato ellipsoideo 1·75 mm. longo. *Fructus* non visus.

Northern Nigeria.—Mongu, 4300 ft., 8 July, flowers white, *H. V. Lely* No. 386.

Fig. 5. *Pentas globifera*, Hutchinson. 1, top of flowering branch; 2, stipule; 3, calyx; 4, the same laid open; 5, upper part of corolla; 6, the same showing insertion of stamens; 7, anther; 8, stigmas.—All enlarged except 1 × ½.

Virecta multiflora, *Smith*; F.T.A. iii. 48.

Naraguta, in great masses over flat cleft rocks, 5 Aug.; herb 9–18 ins. high, flowers pale mauve with two darker lines down the corolla lobes, Hausa "Gogamasu," No. 491.

Distrib.—Upper Guinea generally and Uganda.

Oldenlandia senegalensis, *Hiern* in F.T.A. iii. 56; Holland, 353.

Naraguta, in grass country, 1 Aug.; herb about 2 ft. high, small brown petals, No. 471.

Distrib.—Senegambia to the Eastern Sudan and Uganda.

Oldenlandia Heynei, *Oliv.*; F.T.A. iii. 59; Holland, 353.
Naraguta, 6 Aug.; slender herb 1 ft. high, flowers white, corolla 4-lobed, No. 501.

Oldenlandia capensis, *L.f.*; F.T.A. iii. 62.
Mongu, 4300 ft., 18 July; prostrate, flowers white, 4-parted, No. 440.
Taura, 6 May; minute white flowers, No. 121.

Mussaenda arcuata, *Poir.*; F.T.A. iii. 68; Hutch. in *Kew Bull.* 1921, 249; Holland, 354.
Naraguta, on stream banks, 23 June; shrub 6–10 ft., corolla primrose yellow, hairs on the base of the petals chestnut coloured, turning dark brown after maturity, No. 322.
Distrib.—Sierra Leone across Northern Tropical Africa, south to the Zambesi Basin.

Mussaenda erythrophylla, *Schum. et Thonn.*; F.T.A. iii. 69; Holland, 354.
Naraguta, 20 June; a large shrub 10–30 ft., on stream banks, climbing over trees, corolla tubular, bright yellow or cream within, red and hairy outside, one of the 5 sepals enlarged and vivid red, No. 288.
A most beautiful shrub ranging from Sierra Leone through the hinterland at fairly high altitudes to Angola, the South Eastern Sudan (Monbuttuland), and Uganda.—Figured in the Botanical Magazine, t. 8222.

Sabicea brevipes, *Wernham*, Monogr. Sabicea, 58 (1914).
Naraguta, 20 June; 2–3 ft. high, tough and woody, white flowers in clusters, No. 284.
Vodni, 4600 ft., 13 July, climbing 3–5 ft., heads of pink tubular flowers, No. 427.
Distrib.—Known previously only from Togoland; there is evidently variation in the colour of the flowers.

Macrosphyra longistyla, *Hook. f.*; F.T.A. iii. 106.
Naraguta; 4–8 ft., flowers greenish white, No. 83.
Distrib.—Sierra Leone to Northern Nigeria and in Niamniamland.
A very beautiful shrub, formerly cultivated in our greenhouses and worthy of reintroduction; the flowers are rather variable in length and degree of indumentum and are heavily scented.

Pentanisia Schweinfurthii, *Hiern*; F.T.A. iii. 131; Hutch. in *Kew Bull.* 1921, 250.
Naraguta, 3–4 ins. in clumps, flowers bright blue, No. 3.
Distrib.—Northern Nigeria and East Africa.

Vangueria Dalzielii, *Hutchinson* in *Kew Bull.* 1913, 179; Holland, 360.
Naraguta, shrub 4 ft., flowers green, No. 64.
Distrib.—So far recorded only from Northern Nigeria.

Fadogia Cienkowskii, *Schweinf.*; F.T.A. iii. 154.
Naraguta, 18 ins. high, flowers yellow, No. 48.
Distrib.—Northern Nigeria to Senaar.
The Southern plant referred to this species in the Flora of Tropical Africa is a distinct species.

Fadogia obovata, *N. E. Br.* in *Kew Bull.* 1906, 105.
Naraguta, 25 June; in clumps 24–30 ins. high, stem triangular, ribbed, corolla pale green, No. 326.
Distrib.—This species was gathered in the Kontagora Province in 1911 by Dr. J. M. Dalziel. It has previously not been known except from South East Tropical Africa, where it ranges from North Nyasaland to North Western Rhodesia. The plants from these two distant regions are apparently not separable.

Psychotria Vogeliana, *Benth.*; F.T.A. iii. 210.
Tilde Filani, river bank, 3300 ft., 24 May; shrub 4–5 ft., small white flowers, No. 228.
Distrib.—Gold Coast to the Congo.

Diodia scandens, *Swartz*; F.T.A. iii. 231 (*D. breviseta*, Benth.).
Tilde Filani, 3300 ft., 1 ft. high, small white flowers, No. 225.

Spermacoce filiformis, *Hiern* in F.T.A. iii. 234.
Naraguta, moist places amongst rocks, 8 Aug.; herb 10 ins. high, stems red, flowers white, No. 503.
Distrib.—Endemic to Northern Nigeria.

Spermacoce hebecarpa, var. **major,** *Schweinf.*; F.T.A. iii. 237.
Naraguta, grass lands, 1 Aug.; herb about 1 ft. high, stems bright red, whorls of mauve flowers, No. 473.
Distrib.—Eastern Sudan.

Spermacoce radiata, *Sieb.*; F.T.A. iii. 237.
Naraguta, 1 Aug., about 1 ft. high, flowers white, No. 474.
Distrib.—North Tropical Africa.

Spermacoce globosa, *Schum. & Thonn.*; F.T.A. iii. 240.
Naraguta, in clumps, No. 21.
Tilde Filani, 3300 ft., 24 May, 2 ft. high, spherical heads of white flowers, No. 227.
Distrib.—Cape Verde Islands, Senegambia to Angola.

Octodon setosum, *Hiern*; F.T.A. iii. 242.
Plains between Hepham & Ropp, 4600 ft., 5 July, 15 ins. high, heads of pink flowers, No. 369.
Distrib.—Gold Coast to Nigeria, common in wet places in Northern Nigeria.

Mitracarpum scabrum, *Zucc.*; F.T.A. iii. 243; Holland 378.
Mongu, 4300 ft., 8 July, flowers white, Nos. 399, 400.
Distrib.—Cape Verde Islands and common in Africa.

Compositae.

Ethulia conyzoides, *Linn.*; F.T.A. iii. 262.
Naraguta, 6 ins. high, flowers mauve, No. 37.

Gutenbergia Ruppellii, *Sch. Bip.*; F.T.A. iii. 263.
Naraguta, 26 July, common herb by the roadsides on open land, 2 ft. high, flower heads purple, No. 464.
Distrib.—Known up to the present only from Abyssinia and Kenya Colony.

Gutenbergia nigritana, *Oliv. & Hiern*; F.T.A. iii. 264.
Naraguta, 9–12 ins., heads purple, No. 52.
Distrib.—Also in Southern Nigeria and apparently endemic to the Colony.

Vernonia Perrottetii, *Sch. Bip.*; F.T.A. iii. 272; Holland, 380.
Ropp, 4600 ft., 19 July, 12–18 ins., flowers purple, No. 448.
Distrib.—North and South Tropical Africa.

Fig. 6. *Vernonia saussureoides*, Hutchinson.—part of flowering shoot, × ⅔; 1, flower; 2, stamens; 3, style arms; 4, achene; 5, pappus hairs., enlarged.

Vernonia ambigua, *Kotschy & Peyr.*; F.T.A. iii. 272.
Neill's Valley, 2 miles east of Naraguta Government Station, 15 June, No. 268. Plains between Hepham and Ropp, 4600 ft., 5 July, 18 ins., No. 358. Naraguta, grass country, 1 Aug., herb about 18 ins., flowers mauve, No. 476.
Distrib.—North Tropical Africa and Angola.

Vernonia cinerea, *Less.*; F.T.A. iii. 275; Holland, 379.
Naraguta, 2–4 ft., heads purple, No. 10.

Vernonia saussureoides, *Hutchinson*, sp. nov., inter species africanas aspectu *Saussurei* valde distincta.

Caules plures usque ad 1 m. alti, costati, glabri, circiter 3 mm. crassi, lignosi. *Folia* densiuscula, ascendentia, oblanceolata, apice subacute triangularia, basi longe cuneata, 4–7 cm. longa, 1–2 cm. lata, rigide coriacea glabra utrinque prominenter nervosa, supra nitidula laxe reticulata marginibus integris recurvatis; nervi laterales utrinsecus 5–6, ascendentes. *Capitula* terminalia subsessilia, pauca, subcorymbosa. late turbinata, pallide coerulea, circiter 2 cm. longa et apice 1·5 cm. diametro. *Involucri bracteae* 7–8-seriatae ab exteriore gradatim longiores, exteriores triangulari-ovatae, acutae, interiores oblongo-lanceolatae, usque ad 1·4 cm. longae, purpuratae, marginibus lanatis. *Corollae tubus* 1·5 cm. longus; lobi lineari-lanceolati, subacuti, 5 mm. longi. *Antherae* 5 mm. longae, subacute acuminatae, basi sagittatae. *Styli* rami 4 mm. longi, minute puberuli. *Achaenia* oblonga, minute et parce puberula. *Pappi setae* numerosae, stramineae, exteriores breviores circiter 6 mm. longae, interiores corollae tubo aequilongae.

Northern Nigeria. Naraguta, 20 June, 1921, 2–3 ft. high, flowers cornflower-blue, *H. V. Lely* No. 286.

A very distinct plant with the habit of a *Saussurea*, not related to any particular Tropical African species of *Vernonia*.

Vernonia purpurea, *Sch. Bip.;* F.T.A. iii. 281.

Plains between Hepham & Ropp, 4600 ft., 1 ft. high, heads single, purple, No. 375; 3 ft. high, heads corymbose, No. 376. Ropp, 4600 ft., 19 July, 18 ins., No. 452.

Vernonia nigritana, *Oliv. & Hiern* in F.T.A. iii. 288; Holland, 380.

Ropp, 4600 ft., 19 July, 12–18 ins., deep red inflorescence, No. 458.

Distrib.—Senegambia to Northern Nigeria; described by Barter as a highly ornamental plant with fine crimson flowers.

Vernonia Kotschyana, *Sch. Bip.;* F.T.A. iii. 289; Holland, 380.

Mongu, 4300 ft., 8 July, 15 ins., all the bracts white, flowers mauve, No. 385.

Distrib.—North Tropical Africa from Northern Nigeria to the Red Sea.

Vernonia procera, *O. Hoffm.* in Bull. Soc. Bot. Fr. lv. Mem. viii. 39.

Naraguta, 4000 ft., 3 ft., flowers mauve, No. 70, 30 May No. 242.

Distrib.—Southern Nigeria to the Chari.

Vernonia glaberrima, *Welw. ex O. Hoffm.* in Bol. Soc. Brot. xiii. 15.

Naraguta, 3–4 ft., heads white, Nos. 65, 75.

Distrib.—Here and there over most of the African plateau, especially in Angola and the Zambesi Basin.

Vernonia lappoides, *O. Hoffm.* in Bol. Soc. Broter. xiii. 19 (1896).

Ropp, 4600 ft., 19 July, 1 ft. high, flowers mauve, No. 453.

Distrib.—Angola and the Congo State.

Vernonia oocephala, *Baker* in *Kew Bull.* 1895, 68.
Naraguta, 7 May, 1½–2 ft., heads white, No. 67.
Distrib.—Northern Nigeria and North Nyasaland.

This is a record of considerable interest. *Vernonia oocephala* is a very outstanding member of the genus, and is not closely related with any other African species. Hitherto it has only been known from near Fwambo, North Nyasaland, about 2200 miles away, where it was discovered by A. Carson in 1894.

Aedesia Baumannii, *O. Hoffm.* in Engl. Jahrb. xxiv. 468.
Naraguta, wet places, 10 June; flowers yellow, No. 253.
Distrib.—Gold Coast to Northern Nigeria.

Ageratum conyzoides, *Linn.*; F.T.A. iii. 300; Holland, 381.
Naraguta, 10 ins. high, flowers mauve, No. 39.

Eupatorium africanum, *Oliv. & Hiern* in F.T.A. iii. 301.
Top of Zaranda mountain, 5800 ft., 18 May, 2–2½ ft., flower heads white, No. 191.

Mikania scandens, *Willd.*; F.T.A. iii. 301; Holland, 382.
Naraguta, 23 June, climbing or upright, 1–3 ft., flowers white with a blush of pink, No. 321.

Microglossa volubilis, *DC.*; F.T.A. iii. 309.
Mongu, 4300 ft., 8 July, shrub 4–5 ft., flowers cream, No. 397.

Microglossa angolensis, *Oliv. & Hiern* in F.T.A. iii. 309.
Plain between Bukuru and Hepham, 4300 ft., 4 July, 18 ins., outer heads pale yellow, inner darker, No. 347.
Distrib.—Southward to Angola.

Dicrocephala latifolia, *DC.*; F.T.A. iii. 303.
Plains between Hepham and Ropp, 4600 ft., 5 July, 6–12 ins., flower heads mauve, No. 368.

Conyza persicaefolia, *Oliv. & Hiern* in F.T.A. iii. 312.
Naraguta, 6 ft., flowers yellow, No. 45.
Tilde Filani, 3300 ft., 24 May, 1½–3 ft., flowers golden, No. 234.

Blumea aurita, *DC.*; F.T.A. iii. 322.
Bauchi, 2200 ft., 13 May, 12–18 ins., flower heads green, No. 170.

Blumea lacera, *DC.*; F.T.A. iii. 322.
Baradau, 3000 ft., 3 May; 1–2 ft. flowers golden, No. 92.

Laggera oblonga, *Oliv. & Hiern*; F.T.A. iii. 327.
Naraguta, 6 ins. high, heads white, No. 54.
Distrib.—Sierra Leone to the Congo.

Gnaphalium luteo-album, *Linn.*; F.T.A. iii. 343.
Baradau, 3000 ft., 3 May, up to 2 ft. high, heads silky, flowers pale gold, No. 84.
Takwara, 3200 ft., 4 May, No. 107.

Pulicaria crispa, *Clarke ;* F.T.A. iii. 366; Holland, 384.
Lemme, 2600 ft., up to 12 ins., flowers yellow, No. 131.

Sclerocarpus africanus, *Jacq. ;* F.T.A. iii. 374.
Panyam, 4500 ft., 17 July, 2 ft. high, outer florets 3–4, small and yellow, No. 438.

Wedelia africana, *Beauv. ;* F.T.A. iii. 376.
Naraguta, 1 ft. high, flowers bright yellow, No. 60.
Distrib.—Upper Guinea.

Aspelia helianthoides, *Oliv. & Hiern* in F.T.A. iii. 381.
Jos, 22 June, 1–2 ft. high, flowers pale yellow, No. 312.
Distrib.—Gold Coast to Loanga.

Melanthera Chevalieri, *O. Hoffm. & Muschler* in Bull. Soc. Bot. Fr. lvii. Mem. viii. 117 (1910).
Plains between Hepham and Ropp, 4600 ft., 5 July, 3–4 ft., flowers orange, No. 379.
Distrib.—Chari Region.

Eclipta alba, *Hassk.*; F.T.A. iii. 373; Holland, 384.
Jira, 2 May, 1 ft., flowers white, No. 128.

Spilanthes Acmella, *Linn. ;* F.T.A. iii. 384; Holland 389.
Tilde Filani, 3500 ft., 24 May, No. 233.

Coreopsis Barteri, *Oliv. & Hiern* in F.T.A. iii. 390.
Naraguta, also in large masses covering Jos hills in September, 3 ft., flowers golden, No. 43.
Distrib.—Endemic to Nigeria.

Bidens pilosa, *Linn. ;* F.T.A. iii. 392; Holland, 389.
Naraguta, Nos. 42, 46, 276. Neill's Valley, No. 267. Mongu, 4300 ft., No. 396.

Chrysanthellum procumbens, *Pers. ;* F.T.A. iii. 395.
Lemme, 2600 ft., 7 May, leaves forming a rosette, flowers yellow, Nos. 94, 132.

Tridax procumbens, *Linn.*
Naraguta, 12 ins. high, flowers cream coloured, No. 55.
Distrib.—An introduced Asiatic weed not recorded in the Flora of Tropical Africa; near Lagos it is a common weed on golf courses (Dalziel).

Gynura cernua, Benth.; F.T.A. iii. 402; Holland 390.
Naraguta, 18 ins. high, flowers purple or white, No. 35.

Coreopsis camporum, *Hutchinson*, sp. nov.; affinis *C. Kirkii*, Oliv. et Hiern, sed foliis multo longioribus marginibus minute setulosis dentibus longe setosis pedunculis brevioribus bracteis exterioribus herbaceis linearibus differt.

Herba 1–1·25 m. alta, basin versus dense foliata, superne corymboso-ramosa; caulis conspicue striatus, glaber. *Folia* basalia simpliciter vel rarius bipinnata, usque ad 12 cm. longa, glabra, sicco laete viridia, segmentis linearibus vel linearilanceolatis acutis ad 5·5 cm. longis et 7 mm. latis marginibus

minute setulosis et interdum parce dentatis dentibus e basibus triangularibus longe setosis. *Capitula* numerosa, subcorymbosa, circiter 2–2·5 cm. expansa, pedunculis terminalibus circiter 1 cm. longis, lateralibus usque ad 4 cm. longis superne puberulis. *Involucri bracteae* biseriatae, exteriores herbaceae, patulae, circiter 12, lineares, acutae, 1–1·5 cm. longae, margine setuloso, interiores ascendentes oblongo-lanceolatae, obtuse acuminatae, circiter 6 mm. longae et 2 mm. latae, crebre resinoso-striatae. *Flores radii* flavi, fertiles; corollae tubus 2·5 mm. longus, leviter pubescens; limbus oblongo-ellipticus, apice breviter bilobatus, 1·1 cm. longus, 4 mm. latus, 9–nervius. *Pappus* hirsutus. *Flores disci :* corollae tubus 2 mm. longus, glaber, lobis triangularibus. *Achaenia* complanata, 4–5 mm. longa, ciliato-pubescentia, setis rigidis geminatis 2·5 mm. longis coronata. *Receptaculi bracteae* oblongo-oblanceolatae, minute mucronatae, 5·5 mm. longae, 1·5 mm. latae, medio striatae, marginibus hyalinis.

Northern Nigeria. Plains between Hepham and Ropp, 4600 ft., 5 July, 1921, 2 ft. high, flowers orange, *H. V. Lely* No. 383. Ropp, 4600 ft., 19 July, 1921, 3–4 ft. high, *H. V. Lely* No. 449.

Senecio abyssinicus, *Sch. Bip. ;* F.T.A. iii. 410; Holland, 391.

Naraguta, 8 ins. high, flowers yellow, No. 32.

Distrib.—Nigeria to Abyssinia and in South Tropical Africa.

Senecio baberka, *Hutchinson* in Kew Bull. 1913, 180; Holland, 391.

Naraguta, 10 ins. high, flowers bright yellow, Nos. 13, 59.

Distrib.—Endemic to Northern Nigeria.

Senecio Hochstetteri, Sch. Bip.; F.T.A. iii. 414.

Plains between Hepham and Ropp, 4600 ft., 18 ins., flowers pale yellow, No. 364.

Distrib.—Known hitherto only from the Abyssinian and East African mountains, from 5000–8000 ft.

Senecio Lelyi, *Hutchinson*, sp. nov., habitu *S. penticosti*, Hiern (spec. angolensi), sed foliis inferioribus multo minoribus achaeniis dense pubescentibus differt.

Herba (perennis ?) usque ad 50 cm. alta, gracilis; caules simplices, paucifoliati, sulcati, glabri, basin versus circiter 3 cm. crassi. *Folia* sessilia, lineari-lanceolata, acuta, basi semiamplexicaulia, 5–8 cm. longa, 6–8 mm. lata, glabra, crebre serrulata. *Capitula* 3–4-corymbosa, pedunculata, circiter 1·5 cm. expansa. *Involucri bracteae* 12–14, oblongo-lanceolatae, subacutae, circiter 1 cm. longae, 2·5 mm. latae, glabrae, medio crassae, marginibus late hyalinis; bracteae exteriores paucae, inferioribus dimidio breviores. *Flores radii* flavi, pauci. *Flores disci* fere 1 cm. longi. *Achaenia* dense pubescentia. *Pappi setae* albae, 7 mm. longae.

Northern Nigeria. Plains between Hepham and Ropp, 4600 ft., 5 July, 1921, *H. V. Lely* No. 356.

Echinops longifolius, *A. Rich.*; F.T.A. iii. 431.

Naraguta, 4000 ft., 30 May, flowers white, leaves white below, No. 247.

Distrib.—North Tropical Africa.

Centaurea nigerica, *Hutchinson*, sp. nov., *C. solstitiali*, Linn., remote affinis, sed foliis majoribus, involucri bracteis pectinatis vix spinosis differt.

Herba erecta, usque ad 1 m. alta, superne parce ramosa; caules et rami foliis decurrentibus anguste alati, arachnoideo-villosi. *Folia* linearia vel lineari-oblanceolata, acute apiculata basi decurrentia, 6–8 cm. longa, 0·6–1 cm. lata, firme chartacea vel fere coriacea, integra, utrinque scabrida et etiam tenuiter arachnoideo-villosa, nervis paucis ascendentibus infra conspicuos *Capitula* solitaria, terminalia, sessilia, circiter 3·5 cm. diametr.

Fig. 7. *Centaurea nigerica*, Hutchinson. 1, inner involucral bract; 2, stamen; 3, style; 4, flower; 5, achene & pappus.

et 3 cm. longa. *Involucrum* globoso-campanulatum, superne contractum, circiter 1·5 cm. diametro; bracteae 6–7-seriatae, apice pectinatae, segmentis lineari-filiformibus 2·5–3 mm. longis cartilagineis glabris. *Flores* pallide roseo-coerulei. *Receptaculi* setae albae, filiformes 7–8 mm. longae. *Corollae* tubus anguste cylindricus, superne leviter et sensim ampliatus longitudinaliter nervosus, glaber, lobis linearibus obtusis 5 mm.

longis. *Antherae* 4 mm. longae, filamentis pubescentibus. *Pappi setae* leviter inaequales, albae, 2–3 mm. longae.

Northern Nigeria. Naraguta, 10 June, 1921, 2–3 ft. high, *H. V. Lely* 252.

Centaurea praecox, *Oliv. & Hiern* in F.T.A. iii. 438.

Naraguta, 2–3 ins. high, outer florets white, inner purple, No. 58.

Distrib.—A rare species confined to Northern Nigeria; it was discovered by Barter (No. 1223) in Yoruba and was subsequently gathered by Dalziel (No. 405) in Sokoto Province. The flower-heads are borne on the stem quite close to the ground, the leafy shoots afterwards elongating and barren.

Picris humilis, *DC.*; ex descriptione; F.T.A. iii. 448, in obs.

Naraguta, 4000 ft., 1 ft. high, flowers yellow, No. 24; 18 ins. high, 30 June, No. 341.

This is very probably *Picris humilis*, DC. Prodr. vii. 130, known only from an imperfect specimen collected by Leprieur in Senegal, and not seen by the authors of the Flora of Tropical Africa. It was also gathered in the Katagum district by Dr. J. M. Dalziel (No. 392). The species is easily mistaken for *P. abyssinica*, Sch. Bip., from Abyssinia but the achenes in that species are not attenuated as in the Nigerian plant.

Lactuca capensis, *Thunb.*; F.T.A. iii. 452.

Lemme, 2600 ft., 7 May; 1–2 ft., flowers mauve or purple, Nos. 22, 136.

Naraguta, 4000 ft., 30 June, 4–5 ft. high, flowers purple, No. 338.

Lactuca Welwitschii, *Scott Elliott* in Journ. Linn. Soc. xxix. 30 (1891).

Naraguta, 8 Aug., open grass lands, 1 ft. high, heavy tap root, No. 512.

Distrib.—Congo and Angola.

Ebenaceae.

Maba secundiflora, *Hutchinson*, sp. nov., foliis leviter oblique lanceolatis utrinque attenuatis ciliatis floribus solitariis axillaribus secundis facile distinguenda. (*See* p. 385.)

Frutex ad 4 m. altus; rami vetustiores cinerei, glabrescentes, ultimi dense foliati, ferrugineo-tomentosi. *Folia* oblique lanceolata, utrinque attenuata, obtusa, 4–6 cm. longa, 1–1·6 cm. lata, tenuiter coriacea, margine cartilagineo ciliato, utrinque fere glabra et reticulata; costa infra conspicua, pubescens; nervi laterales numerosi, patuli, multe ramosi; petioli 3 mm. longi, dense pilosi. *Flores* ♀ tantum visi, axillares, secundi, trimeri, reflexi, fere ebracteati; pedicelli 2 mm. longi, tomentosi. *Calyx* campanulatus, leviter et obtuse 3-lobatus, 5 mm. longus, utrinque dense ferrugineo-hirsutus. *Corolla* calyce leviter exserta, superne extra appresse pilosa; tubus cylindricus, 3·5 mm.

longus, lobis ovato-rotundatis marginibus glabris undulatis dorso appresse villosis. *Ovarium* ovoideum, villosum, triloculare, loculis biovulatis. *Fructus* stramineus, oblique oblongus, mucronatus, 1·5 cm. longus, parce appresse lanatus, basi calyce persistente cupulare 4 mm. longo circumdatus.

Northern Nigeria. Tilde Filani, 3300 ft., 24 May, shrub about 12 ft. high on banks of streams, flowers brownish, pendant on the underside of the branchlets, *H. V. Lely*, No. 229.

Katagum district, in ravines, fruiting specimen, *J. M. Dalziel*, No. 413.

A very distinct species rather closely related to one from Nyasaland as yet undescribed. Male flowers are not yet known.

Fig. 8. *Maba secundiflora*, Hutchinson. 1, female flowering shoot, × ⅔; 2, fem. flower; 3, corolla opened out; 4, pistil; 5, longitudinal section of same; 6, fruit—enlarged. (*See* p. 384.)

Campanulaceae.

Wahlenbergia riparia, *A.DC.*; F.T.A. iii. 480.
Takwara, 3200 ft., 4 May, 1–2 ft., flowers flax-blue, No. 108.
Taura, 1 ft., 6 May, No. 120.

Oleaceae.

Jasminum obtusifolium, *Baker*; F.T.A. iv. i. 4.
Lemme, on stream banks, 7 May; shrub 10 ft., flowers white, sweet-scented, No. 157.
Distrib.—An endemic North Nigerian species.

Jasminum pauciflorum, *Benth.*; F.T.A. iv. i. 6.
Naraguta, 10 June, No. 251.
Distrib.—Sierra Leone to Nigeria and in Uganda.

Jasminum ternifolium, *Baker*; F.T.A. iv. i. 9.
Tilde Filani, 3300 ft., 24 May; shrub 3–5 ft., flowers snow white, No. 235.

Distrib.—Northern Nigeria to Bongoland, and in Angola.

Jasminum mauritianum, *Bojer*; F.T.A. iv. i. 10.
Naraguta, 1½–2 ft., flowers cream coloured, fruits black, No. 61.

Distrib.—Apparently very variable and widely distributed in East and South Tropical Africa; our plant matches very well with specimens from Mauritius, the type locality.

Apocynaceae.

Landolphia amoena, *Hua*; F.T.A. iv. i. 46.
Naraguta, climber, flowers white, scented, No. 50.

Distrib.—French Guinea to the Chari.

Carissa edulis, *Vahl*; F.T.A. iv. i. 89; Holland, 438.
Naraguta, on stream banks, bush 10–12 ft., flowers pink, sweet scented, No. 49.

Asclepiadaceae.

Cryptolepis nigritana, *N.E.Br.* in F.T.A. iv. i. 251.
Naraguta, 2 ft., flowers yellow, No. 63.
Nabardo, 2300 ft., 20 May, 2–3 ft., stem rough and sticky, flowers yellow, No. 216.

Distrib.—Togoland to East Africa.

Tacazzea Barteri, *Baill.*; F.T.A. iv. i. 266.
Lemme, 7 May, climbing, flowers green, No. 152.

Distrib.—This is the first gathering of this species in Northern Nigeria since discovered by Barter in Nupe. Chevalier records the species from the French Sudan and Dahomey, but his specimens have not been seen by the writer (see Chevalier Expl. Bot. Afr. Occid. Fr. i. 429 (1920)).

Tacazzea apiculata, var. **benedicta,** *Scott Elliot*; F.T.A. iv. i. 267.
Tilde Filani, 3300 ft., 24 May, twining 15 ft., flowers greenish, No. 231.

Kanahia glaberrima, *N.E.Br.* in F.T.A. iv. i. 297.
Jira, river beds and banks, 2 May, 4–5 ft., flowers white, sweet scented, No. 125.

Distrib.—East Africa and Angola.

Xysmalobium Heudelotianum, *Decne.*; F.T.A. iv. i. 304.
Bichikki, 2200 ft., 17 May; 6 ins., flowers green and purple, No. 177.
Mongu, 4300 ft., 18 July; 18 ins., No. 439.

Distrib.—Senegambia to Northern Nigeria.

Asclepias lineolata, *Schltr.*; F.T.A. iv. i. 322; Holland, 465.

Tilde Filani, 3300 ft., 24 May; 24–30 ins. petals green, veined with purple, No. 236.

Distrib.—From Nigeria east and southwards over most of Tropical Africa.

Oxystelma bornouense, *R.Br.*; F.T.A. iv. i. 383.

Lemme, 2600 ft., river banks, 7 May; climbing 10–12 ft., flower deeply purple veined, grey underneath, No. 144.

Distrib.—Senegal to Somaliland.

Sarcostemma viminale, *R.Br.*; F.T.A. iv. i. 384.

Takwara, 3200 ft., 4 May, flowers cream coloured, No. 109.

Margaretta inopinata, *Hutchinson*, sp. nov.; affinis *M. Whytei*, K. Schum., sed inflorescentiis solitariis brevissime pedunculatis pedicellis brevissimis, coronae lobis flavis differt.

Caules 15–30 cm. alti, simplices, pubescentes. *Folia* patula, oblongo-linearia vel oblongo-lanceolata, acuta, basi rotundata, 3–5·5 cm. longa, 0·5–1·1 cm. lata, chartacea, utrinque setuloso-pubescentia, marginibus recurvis hispidulis. *Inflorescentia* terminalis, breviter pedunculata, circiter 5-flora; pedunculus molliter tomentosus, circiter 5 mm. longus; pedicelli 1–2 mm. longi; bracteae subulatae, puberulae, 3 mm. longae. *Calycis segmenta* lanceolato-subulata, acuta, 3·5 mm. longa, dense pubescentia. *Corollae segmenta* oblongo-linearia obtusa, membranacea, venosa, 7 mm. longa, glabra. *Coronae lobi* petaloidei, flavi, spathulati, superne integra, 8 mm. longi, 4 mm. lati, infra medium dentibus 3 inflexis. *Antherae* appendiculi erecti, triangulari-acuti, 1·5 mm. longi. *Stylus* truncatus.

Northern Nigeria. Plains between Hepham and Ropp 4600 ft., 5 July, 1921, root a stout swollen tuber, flowers (coronal lobes) bright yellow, *H. V. Lely* No. 366.

Up to the present the genus *Margaretta* has been recorded only from East Africa, from Uganda to South Rhodesia. The occurrence of an undescribed species in Northern Nigeria is interesting. The specimen before us bears a solitary immature hairy beaked fruit, borne on a long elongated peduncle (about 10 cm.) situated opposite the flowering inflorescence between the topmost pair of leaves.

Ceropegia Ledermannii, *Schlechter* in Engl. Bot. Jahrb. li. 154 (1913). (*See* p. 388.)

Takwara, 3200 ft. 4. 6. 1921, No. 110.

This plant has been identified from the original description, but there is little doubt as to the correctness of the determination owing to the striking nature of the flowers with their long filiform-linear lobes arising from a triangular base and the presence of a subulate tooth between each. Schlechter's description was drawn up from specimens collected near Kei-Buba in the Northern Cameroons. In the following, probably minor points, the Nigerian specimens differ from the details given by Schlechter :—the leaves are on the whole longer and broader,

up to 8·5 cm. long and 7 mm. broad; the corolla has in the largest flower a length of 1·4 dm., the tube being 8 cm. long; the long green corolla segments are pilose but not densely so; the teeth of the outer corona are 1·5 mm. high and the lobes of the inner corona 4 mm. high.

Schlechter places the affinity of the plant with the South African *C. tomentosa*, Schl. but it is much more nearly related to *C. abinsica*, N.E.Br. (W. B. Turrill).

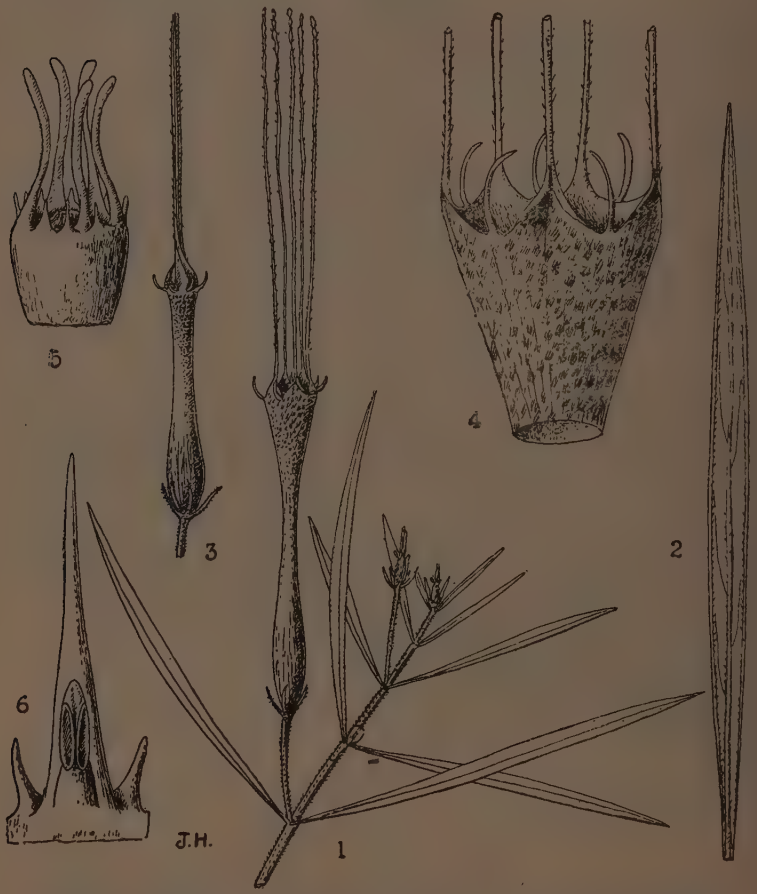

Fig. 9. *Ceropegia Ledermannii*, Schlechter. 1, portion of flowering branch, × ⅔; 2, leaf, × 1½; 3, flower just before opening, × ⅔; 4, enlarged portion of corolla showing base of lobes and intermediate appendages; 5, corona; 6, corona lobe from within. (*See* p. 387.)

Ceropegia rhynchantha, *Schlechter* in Engl. Bot. Jahrb. li. 155 (1913).

Naraguta, climbing 2–3 ft., amongst rocks, No. 550; Naraguta, trailing in rock crevices over grass, 3–4 ft.

long, No. 523; Kadaura, 30 miles east of Jos, 19 Sept., No. 599.

The above specimens have been identified from Schlechter's original description of a plant from Kokumi in Northern Cameroon. As indicated by Mr. Lely there is a certain amount of variation in the colour of the corollas and also, as seen in his specimens, in the breadth of the leaves (W. B. Turrill).

Ceropegia pedunculata, *Turrill*, sp. nov.; affinis *C. angustae*, N. E. Br., sed foliis hispidulis floribus multo minoribus distinguitur.

Herba perennis, volubilis. *Caulis* ramique filiformes, flexuosi, glabri. *Folia* patula, lineari-lanceolata, acutissima vel obtusa sed mucronata, basi rotunda, subpeltata, usque as 5 cm. longa, saepissime 3 cm. longa, 3–8 mm. lata, costa media in pagina inferiore prominente hispidula superiore sulcata, nervis lateralibus utrinque inconspicuis, supra omnino hispidula, infra costa media margineque excepta glabra; petioli circiter 3 mm. longi, hispidi. *Cymae* extra-axillares, umbelliformes, pauciflorae; pedunculus 1·5–5 cm. longus, glaber; pedicelli circiter 5 mm. longi, glabri; bracteae minutae, anguste lineares. *Sepala* lineari-lanceolata, superne attenuato-acuminata, 2·5 mm. longa, 1 mm. lata, glabra. *Corolla* tubulosa, extra glabra; tubus 1·6 cm. longus, basem versus 4 mm. diametro, medio constrictus, 3 mm. diametro, fauce gradatim ampliatus, 6 mm. diametro; segmenta e basi triangularia linearia, 1·3 cm. longa, 2 mm. lata, apice acuta leviter connata. *Corona exterior* 2 mm. longa, dentibus 10 plus minusve longe pilosis instructa. *Corona interior* 4 mm. longa, lobis 5 linearibus erecto-conniventibus glabris praedita. *Ovaria* anguste cylindracea, 1·5 cm. alta, glabra.

Northern Nigeria. Bornu Road and Kilba country, 4.8.1909, *J. M. Dalziel* 96. Naraguta, 5.8.1921, plant trailing in rock-crevices, 3–4 ft. long; corolla red, brown and green, Hausa name "Kafan Fakara" (Partridge Foot), *H. V. Lely* No. 495.

Leptadenia lancifolia, *Decne.*; F.T.A. iv. i. 430; Holland 466.
Lemme, 2600 ft., 7 May; climbing and spreading 2–4 ft., whitish flowers in clusters, No. 137.

Distrib.—North Tropical Africa.

Gentianaceae.

Exochaenium pumilum, *A. W. Hill* in *Kew Bull.* 1908, 337.
Belmontia pumila, Baker; F.T.A. iv. i. 552.
Naraguta, small plant in marsh ground, only one example found, 17 Aug.; 2 ins., flowers white, sepals keeled, No. 542.

Distrib.—A tiny Gentianaceous plant originally found by Barter in a swamp at Lom, and not found again until collected by Mr. Lely.

Exochaenium macranthum, *A. W. Hill* in *Kew Bull.* 1908, 339.
Naraguta, open grass land, 22 July, herb 6 ins. high, flowers pale apricot, sepals keeled, No. 463.

Distrib.—East Africa and Angola.

Neurotheca loeselioides, *Oliv.;* F.T.A. iv. i. 560.
Naraguta, in watery soil over rock slopes, 8 Aug., 1–3 ins. high, flowers blue, No. 530.

Distrib.—Upper Guinea to Gaboon and in Uganda.

BORAGINACEAE.

Heliotropium ovalifolium, *Forsk.;* F.T.A. iv. ii. 34.
Mamu, 2500 ft., 11 May; small white flowers in recurved spike, No. 164.

Heliotropium indicum, *Linn.;* F.T.A. iv. ii. 37; Holland, 472.
Lemme, 7 May, robust plant up to 2 ft., flowers heliotrope, No. 151.

Heliotropium strigosum, *Willd.;* F.T.A. iv. ii. 41.
Lemme, 2600 ft., 7 May, on farms up to 1 ft., flowers white, No. 124.
Bichikki, 2200 ft., 17 May, No. 184.

Trichodesma africanum, *R. Br.;* F.T.A. iv. ii. 48; Holland, 472.
Bauchi, 2200 ft., 13 May, corolla white, recurved, shiny brown spot at base of lobes, No. 169.

Distrib.—Cape Verde Islands to Abyssinia and in Angola.

CONVOLVULACEAE.

Evolvulus alsinoides, *Linn.;* F.T.A. iv. ii. 67; Holland, 473.
Baradau, 3000 ft., 3 May, flowers bright blue, decumbent and spreading on hard soils, No. 89.

Convolvulus sagittatus, var. **abyssinica,** *Hallier* f.; F.T.A. iv. ii. 96.
Plains between Hepham and Ropp, 4600 ft., 5 July; decumbent 2–3 ft., flowers mauve, No. 362.

Ipomoea blepharophylla, *Hallier f.;* F.T.A. iv. ii. 141.
Naraguta, 20 June, creeper 1–3 ft., leaves rough, corolla mauve, with darker throat, No. 311.
Mongu, 4300 ft., 8 July; creeping 2 ft., stem brown, mauve flower with long calyx, No. 392.

Distrib.—Gold Coast to Jurland and in Angola.

Ipomoea involucrata, *Beauv.;* F.T.A. iv. ii. 150; Holland, 480.
Naraguta, 8 Aug., trailing over stones 4–6 ft., flowers mauve, 1–2 ins. in diam., only one flower out at a time from amongst a number, No. 514.

Ipomoea fragilis, *Choisy;* F.T.A. iv. ii. 165.
Naraguta, roadsides, decumbent, flowers yellow, No. 7.

Ipomoea Barteri, *Baker;* F.T.A. iv. ii. 169.
Mongu, 4300 ft., 8 July, climbing 2 ft., flowers 2 ins. in diam., pale pink, No. 391.
Distrib.—Confined in its typical form to Northern Nigeria.

Ipomoea aquatica, *Forsk.;* F.T.A. iv. ii. 170; Holland, 474.
Lemme, 2600 ft., 7 May, flowers large, purple, No. 143.
Panyam, 4500 ft., 11 July, 3–4 ft., flowers 2 ins. in diam., purple, No. 414.

Solanaceae.

Solanum torvum, *Swartz;* F.T.A. iv. ii. 231.
Jos, 22 June; 2–3 ft., flowers mauve, No. 316.
Distrib.—South to Angola.

Solanum duplosinuatum, var. **semiglabrum,** *C. H. Wright;* F.T.A. iv. ii. 244; Holland, 482.
Baradau, 3000 ft., 3 May, 2 ft. high, flowers mauve, No. 91.
Distrib.—Collected in Nupe by Barter, who states it is cultivated for its yellow fruit about the size of a tomato.

Schwenkia americana, *Linn.;* F.T.A. iv. ii. 260; Holland 505.
Jira, 2 May, 18 ins. flowers greeny brown, No. 130.

Scrophulariaceae.

Dopatrium longidens, *Skan* in F.T.A. iv. ii. 325.
Naraguta, 8 Aug., a herb 6 ins. high, growing in masses in shallow rock pools, flowers bright mauve and white, very ornamental, No. 526.

This beautiful little aquatic plant would be an acquisition for growing in warm water tanks in our greenhouses and we hope Mr. Lely will be able to send a supply of seeds. He is the first collector to find it since the type specimen was discovered long ago by Barter in Nupe. Both collectors speak of the highly ornamental character of the species. According to Barter it grows on rocks in pools after rains; flowers reddish purple, lip of corolla with a white spot, large for the size of the plant.

Lindernia nummulariaefolia, *Wettst.;* F.T.A. iv. ii. 341.
Naraguta, 8 Aug., tiny herb, 3–5 ins. high, flowers mauve and white, No. 518.

Ilysanthes gracilis, *Skan* in F.T.A. iv. ii. 349
Naraguta, 8 Aug., a delicate little herb about 3–4 ins. high, with square stems and pink and white flowers, No. 519.
Distrib.—This and the next have not been gathered in Northern Nigeria since first discovered by Barter. Chevalier records *I. gracilis* from Fouta Djalon and the Ivory Coast and *I. Barteri* from the Koulikoro district in the French Sudan.

Ilysanthes Barteri, *Skan* l.c. 350.
Naraguta, 8 Aug., minute little herb, 2–4 ins., flowers bright blue, No. 520.

Scoparia dulcis, *Linn.;* F.T.A. iv. ii. 354; Holland, 506.
Naraguta, 12 ins., flowers pale mauve, No. 33.

Alectra senegalensis, *Benth.;* F.T.A. iv. ii. 371.
Naraguta, 8 Aug., a small herb amongst stones, uncommon, flowers yellow, No. 502.
Distrib.—Senegambia to Nyasaland.

Striga orobanchoides, *Benth.;* F.T.A. iv. ii. 402.
Naraguta, 5 Aug., in rock crevices near water, 9 ins. high, large root, tough stems, flowers pink, Hausa "Tokan Dawa," No. 489.
Distrib.—Wide; parasite on roots of *Indigofera* and other plants. According to Dalziel (Herb. Kew) very common in fields of millet, etc.

Striga aspera, *Benth.;* F.T.A. iv. ii. 403.
Naraguta, 20 June; slender spikes of bright pink flowers, No. 278.
Distrib.—Senegambia to Kenya Colony.

Striga strictissima, *Skan;* F.T.A. iv. ii. 407.
Lemme, 2600 ft., 7 May, 1½–2 ft., flowers pink, No. 146.
Distrib.—A rare species collected by Barter in Nupe, and probably occurring also in Djurland.

Striga lutea, *Lour.;* F.T.A. iv. ii. 409.
Naraguta, 8 Aug., herb 6–8 ins. high, in rock cracks and gravel over rock, flowers yellow, No. 525.
Neill's Valley, Naraguta, 15 June; 6–8 ins. high, flowers scarlet with green centre, No. 254.
The flowers of this species vary from scarlet to yellow or white.

Striga Forbesii, *Benth.;* F.T.A. iv. ii. 410.
Neill's Valley, 2 miles east of Naraguta Government Station, 15 June; 6 ins. high, corolla salmon pink, No. 255.

Sopubia ramosa, *Hochst.;* F.T.A. iv. ii. 449.
Naraguta, in grass country, 20 Aug., brittle stemmed herb, about 18 ins., flowers small, pink, No. 545.

Sopubia simplex, *Hochst.;* F.T.A. iv. ii. 450.
Naraguta, 1–2 ft., flowers pink, No. 23; flowers purple, No. 38.

Sopubia parviflora, *Engl.;* F.T.A. iv. ii. 452.
Naraguta, 8 Aug., in damp soil over rock, herb about 1 ft. high, flower yellow with purple centre, No. 524.
Distrib.—Djurland and Angola.

Lentibulariaceae.

Utricularia tribracteata, *Hochst.;* F.T.A. iv. ii. 475.
Naraguta, 8 Aug., minute herb about 2 ins. high with delicate mauve flowers, No. 521.
Distrib.—Also in Abyssinia and Somaliland; collected also by Dalziel near Lokoja (No. 133) and Yola (134).

Utricularia micropetala, *Smith;* F.T.A. iv. ii. 483.

Naraguta, 27 Aug., a small yellow herb 4–5 ins. growing on wet rocks, flowers yellow, No. 553.

Distrib.—Hitherto only known from Sierra Leone.

Utricularia subulata, *Linn.;* F.T.A. iv. ii. 485.

Naraguta, 8 Aug., minute herb 1–2 ins., flowers yellow, No. 522.

Utricularia rigida, *Benj.;* F.T.A. iv. ii. 487.

Naraguta, 27 August; a small herb about 2 ins. high with white flowers growing on flat rocks in running water, No. 555.

Distrib.—Sierra Leone to Nigeria.

This is referred to *U. rigida* with some reserve owing to the somewhat different aspect of the original plant, which presents a stouter flowering scape and somewhat more robust vegetative branches. Fruiting specimens, however, collected by Barter on Sugarloaf Mountain near Freetown, Sierra Leone, connect the two forms in a way suggesting ecological differentiation rather than genetic. Samples collected by Chevalier between Yinba and Kouria in French Guinea represent exactly the same condition as Mr. Lely's. The latter describes the flowers as white. In the dry state as received they are decidedly yellow and this colour becomes more pronounced on boiling.

U. rigida is an isolated type among the African species of *Utricularia* as far as they are known, and approaches most closely the Brasilian *U. neottioides*. It has no bladders and the plants are attached by hapters to the rocks or boulders of swift streams or cataracts.—(O. Stapf.)

PEDALINEAE.

Ceratotheca sesamoides, *Endl.;* F.T.A. iv. ii. 563.

Mamu, 2500 ft., 11 May, ½–2 ft.. flowers mauve, white inside with longitudinal purple lines, No. 162.

Naraguta, 26 July, No. 465.

ACANTHACEAE.

Hygrophila spinosa, *T. Ands.;* F.T.A. v. 31.

Naraguta, No. 30; 6 Aug., 2–3 ft., flowers purple, No. 500.

Brillantaisia Lamium, *Benth.;* F.T.A. v. 38.

Naraguta, 29 July, on roadsides, herb about 18 ins., corolla a deep rich purple, with two white patches on each side of base of lower petal, No. 469.

Dyschoriste radicans, *Nees;* F.T.A. v. 73.

Naraguta, 3 Aug., in clumps by the roadside, herb about 1 ft. high, flowers mauve, No. 483; flowers blue-purple, 20 Aug., No. 548.

Lepidagathis mollis, *T. Ands.;* F.T.A. v. 126.

Plains between Hepham and Ropp, 4600 ft., 5 July, 1–2 ft., bracts and sepals pale green, flowers white, No. 377.

Distrib.—Northern Nigeria and Uganda.

Asystasia coromandeliana, *Nees;* F.T.A. v. 131.
Jos, 26 June, 1–2½ ft., flowers mauve and white, No. 314.
Mongu, 4300 ft., 10 July, trailing or upright, 3–4 ft., flowers mauve, with purple throat, No. 402.

Justicia Galeopsis, *T. Ands.;* F.T.A. v. 196.
Pankshin, 5100 ft., 14 July; 1–1½ ft., stem ribbed, flowers bright pink, upper lip paler, No. 432.
Distrib.—North Tropical Africa.

Monechma hispidum, *Hochst.;* F.T.A. v. 213.
Plains between Bukuru and Hepham, 4300 ft., 4 July; 18 ins. high, lower lip of corolla cream white with orange lines on raised throat, upper lip blotched with dark green, No. 349.
Distrib.—North and East Tropical Africa.

Monechma depauperatum, *C. B. Clarke;* F.T.A. v. 217.
Panyam, 4500 ft., 11 July, 1 ft. high, bracts pale green with dark green midrib, corolla white, lower lip with purple lines across raised portions of throat, No. 409.
Distrib.—Sierra Leone to Lagos and Northern Nigeria.

Verbenaceae.

Lantana Camara, *Linn.;* F.T.A. v. 275.
Naraguta, 20 Aug., shrub about 5 ft. high amongst rocks, flowers orange, No. 547.

Lantana salvifolia, *Jacq.;* F.T.A. v. 276.
Pankshin, 5100 ft., 2–3 ft. high, flowers pale mauve, No. 431.

Lantana trifolia, *Linn.;* F.T.A. v. 277.
Nabardo, 2300 ft., 20 May; 1½–2 ft. high, leaves either two or three at a node, flowers cerise coloured, No. 213.

Stachytarpheta angustifolia, *Vahl;* F.T.A. v. 284.
Lemme 2600 ft. 7 May, 18 ins. high, flowers mauve, No. 142.
Distrib.—North and West Tropical Africa and in Tropical America.

Peristrophe pilosa, *Turrill,* sp. nov.; affinis *P. bicalyculatae,* Nees, sed caulibus pilis longis patulis instructis, inflorescentiis valde reductis vix 1·5 cm. longis in foliorum axillis differt.

Herba erecta, ramosa, caulibus 6-angularibus longitudinaliter striatis pilis albis distinctis patulis 2–3 mm. longis instructis. *Folia* elliptica, lanceolata vel elliptico-lanceolata, apice attenuato-acuminata, basi subacuta, lamina 7 cm. longa et usque ad 2·7 cm. lata, costa nervisque in pagina utraque prominentibus, nervis lateralibus utrinque circiter 6, pilis albis distinctis in pagina utraque praecipue in nervis praedita; petiolus 1–1·5 cm. longus, patule pilosus. *Inflorescentiae* axillares, 3–4-florae, 1·5 cm. longae; spiculae uniflorae; bracteae lineares, acuminatae, 1·2 cm. longae, marginibus dorsoque asperulis; bracteolae lineari-lanceolatae, acutissime acuminatae, 7 mm. longae, dorso leviter asperulae. *Calycis* segmenta 5, lineari-lanceolata, acu-

minata, 4 mm. longa, ciliata. *Corolla* circiter 1 cm. longa, superne extra piloso-pubescens. *Stamina* dua, filamentis leviter pubescentibus 4 mm. longis, antheris 1·5 mm. longis bilocularibus loculis rotundatis superpositis; pollinis granula ellipsoidea, 40μ longa, 28μ diametro. *Ovarium* 1·5 mm. longum, 0·75 mm. diametro; stylus 7·5 mm. longus, glaber.

Northern Nigeria. Panyam, 4500 ft., 11 July 1921, 2 ft. high, small pink flowers, *H. V. Lely* No. 415.

Clerodendron capitatum, *Sch. & Thonn.*; F.T.A. v. 305.

Pankshin, 5100 ft., 14 July; 2 ft. high, corolla white, 3 ins. long, No. 435.

Naraguta, 5 Aug., 10–12 ft. high, in thickets amongst rocks, flowers white and sweet-scented, No. 497.

Clerodendron Lelyi, *Hutchinson*, sp. nov.; affinis *C. myricoidei*, R. Br., a forma typica abyssinica caulibus simplicibus crassis (vix lignosis), foliis elongato-oblongo-oblanceolatis multo majoribus pedicellis haud elongatis differt.

Caules simplices, acute angulati, basin versus circiter 6 mm. crassi, scabrido-hispiduli. *Folia* ternatim verticillata, sessilia, elliptico-oblanceolata, apice plus minusve triangularia, cartilagineo-mucronata, basi late obtusa, 8–10 cm. longa, 1·5–4 cm. lata, rigide chartacea, remote crenato-serrata, utrinque laxe setuloso-scabrida; nervi laterales utrinsecus circiter 5, secondariis paucis. *Panicula* foliata, pyramidalis, circiter 18 cm. longa; rami laterales inferiores cymosi, circiter 6 cm. longi, foliis subnormalibus subtendentes; pedicelli ultimi 2 mm. longi, glabri; bracteolae subulatae, 2–3 mm. longae, puberulae. *Calyx* late turbinatus, 3 mm. longus, parce puberulus, lobis triangulari-rotundatis ciliolatis. *Corolla* alba et coerulea, circiter 1·5 cm. longa; tubus glaber, lobis rotundatis crebre ciliolatis. *Stamina* longe exserta, filamentis basi villosis, antheris 2 mm. longis. *Stylus* gracilis, glaber, apice bilobatus. *Fructus* immaturus inaequaliter bilobatus, sicco niger, glaber.

Northern Nigeria. Mongu, 4300 ft., 8 July, 1921, stems 2 ft. high, lower corolla lobe pale mauve, the others white, *H. V. Lely* No. 384.

Labiatae.

Ocimum knyanum, *Vatke*, var. **astephanum,** *Baker* in F.T.A. v. 346.

Naraguta, 1–3 ft., flowers purple, No. 16.

Platystoma africanum, *P. Beauv.*; F.T.A. v. 349.

Naraguta, 2 Aug., roadsides and grass lands or rocks, herb about 1 ft. high, flowers pale blue, odour of sage, No. 479; 17 Aug., flowers white, No. 539.

Geniosporum paludosum, *Baker*; F.T.A. v. 352.

Plain between Bukuru and Hepham, 4300 ft., 4 July, 2–3 ft. high, bracts and flowers white, mint odour, No. 345.

Distrib.—East Tropical Africa.

Acrocephalus alboviridis, *Hutchinson*, sp. nov., caulibus sicco nigro-purpureis glabris foliis oblongo-ovatis glabris capitulis sphaericis alboviridibus distincta.

Planta lignosa usque ad 1·3 m. alta, superne corymboso-ramosa; caulis obscure quadrangularis, basin versus circiter 6 mm. diametro, internodiis circiter 2 cm. longis. *Folia* sessilia, oblongo-ovata, acuta vel acute acuminata, 2–4 cm. longa, 0·7–1·7 cm. lata, rigide coriacea, serrato-crenata, glabra, nervis lateralibus obscuris. *Capitula* sphaerica, alboviridia, dense corymboso-conferta, circiter 1·5 cm. longa, dense villoso-tomentosa; bracteae dense confertae, late obovato-orbiculares, apice breviter triangulares, circiter 1 cm. longae et 1·2 cm. latae, extra superne dense villoso-tomentosae, intra glabrae. *Calyx* dentatus, extra dense villosus, intra glaber. *Corolla* infundibuliformis, 6 mm. longa, fere glabra, lobis ovatis obtusis. *Stamina* exserta; filamenta circiter 6 mm. longa, glabra; antherae 0·75 mm. longae. *Stylus* staminibus paullo brevior, bifidus. *Ovarium* glabrum.

Northern Nigeria. Ropp, 4600 ft., 19 July, 1921, 3–4 ft. high, spherical greenish white heads with pale mauve flowers, *H. V. Lely* No. 456.

Orthosiphon salagensis, *Baker;* F.T.A. v. 368.

Bichikki, 2200 ft., 17 May, 15 ins. high, spikes of reddish purple flowers with odour of sage, No. 186.

Distrib.—Gold Coast and Northern Nigeria.

Orthosiphon bracteosus, *Baker;* F.T.A. v. 375.

Naraguta, 18 ins., bracts purple, flowers white with purple veins, No. 47.

Distrib.—Upper Guinea and East Africa, south to Nyassaland.

Hoslundia opposita, *Vahl*, var. **verticillata,** *Baker;* F.T.A. v. 377.

Top of Zaranda Mt., 5800 ft., 18 May, upright 2–4 ft. high, flowers greenish white, No. 192.

Aeolanthus pubescens, *Benth.;* F.T.A. v. 394.

Naraguta, 5 Aug., herb about 1–2 ft., with strong balsamiferous odour, flowers pale blue, No. 494.

Distrib.—Endemic to Nigeria north of Abeokuta.

Solenostemon ocymoides, *Sch. & Thonn.;* F.T.A. v. 420.

Vodni, 4600 ft., 13 July, 1½–2 ft., flowers bright red purple, No. 420. Naraguta, 17 Aug., on farms, flowers pink, No. 540.

Hyptis pectinata, *Poit.;* F.T.A. v. 448.

Ringim Mukr, 2500 ft., 22 May, woody perennial 6–10 ft., flowers pale mauve, with sage odour, No. 219.

Naraguta, 20 Aug., about 6 ft., in open grass country, No. 551.

Hyptis suaveolens, *Poit.;* F.T.A. v. 449.

Bichikki, 2200 ft, a robust branching plant 3–4 ft high, on farms, flowers dark purple, strong mint-like odour, No. 183.

Introduced from Tropical America.

Leucas martinicensis, *R. Br.;* F.T.A. v. 479.
Naraguta, 1 Aug., herb. about 15 ins., globular whorls of white flowers, calyx prickly, No. 475.

Tinnaea aethiopica, *Kotschy & Peyr.;* F.T.A. v. 497.
Zelau, 3200 ft., 24 Apr., bush 8–10 ft., on stream banks, flowers a deep velvety red brown, almost black at tip of lower lip, No. 112.

Nyctaginaceae.

Boerhaavia adscendens, *Willd.;* F.T.A. vi. i. 4.
Baradau, 3000 ft., 2 ft. high, flowers pink, No. 86.

Boerhaavia repens, *Linn.;* F.T.A. vi. i. 4.
Mamu, 2500 ft., 11 May; 2 ft. high, minute pink flowers, Hausa "Babba juji," taken as a cure for faintness due to hunger, No. 167.

Amarantaceae.

Celosia laxa, *Sch. & Thonn.;* F.T.A. vi. i. 18.
Mongu, 4300 ft., 10 July, 2 ft. high, flowers pale pink, stamens bright pink, No. 403.

Celosia trigyna, *Linn.;* F.T.A. vi. i. 19.
Baradau, 3000 ft., 3 May, 12 ins. high, flowers white, No. 90.

Amaranthus spinosus, *Linn.;* F.T.A. vi. i. 32.
Takwara, 3200 ft., 14 May, stem thorny, 1 ft. high, flower spikes green, No. 102.

Amaranthus oleraceus, *Linn.;* F.T.A. vi. i. 34.
Mamu, 2500 ft., 11 May; 1–1½ ft., small clusters of red or mauve flowers, Hausa "Zakin Bamza," eaten as a vegetable, No. 166.

Pandiaka involucrata, *Moq.;* F.T.A. vi. l. 67.
Naraguta, 4000 ft., 30 May, No. 239.
Distrib.—Gold Coast to Nigeria.

Alternanthera achyranthoides, *Hiern;* F.T.A. vi. i. 73.
Naraguta, trailing in stream bed, No. 29. Lemme, 2600 ft. 18 ins. long, clusters of green white flowers, No. 145.

Polygonaceae.

Polygonum serrulatum, *Lag.;* F.T.A. vi. i. 107.
Zaranda Filani, 19 May, in marshes, 3–4½ ft high, flowers pink. No. 200. Plains between Hepham and Ropp, 4600 ft., 5 July, 1–2 ft, flowers red, No. 365. Pankshin, 5100 ft., 14 July, in marshes, 2 ft. high, flowers red, No. 430.

Polygonum lanigerum, *R. Br.;* F.T.A. vi. i. 109.
Naraguta, 23 June, damp places in masses, 5–6 ft., whole plant silvery, flowers white, No. 323.

Polygonum senegalense, *Meisn.;* F.T.A. vi. i. 111.

Tilde Filani, 3300 ft., 24 May, 2–3 ft. high in river bed, flowers white, No. 226.

Rumex abyssinicus, *Jacq.;* F.T.A. vi. i. 114.

Plains between Hepham and Ropp, 4600 ft., 5 July, 2–5 ft., No. 367.

PROTEACEAE.

Protea argyrophaea, *Hutchinson*, sp. nov.; affinis *P. Elliottii*, C. H. Wright, sed foliis multo angustioribus capitulis minoribus, perianthii limbo libero superne glabro differt.

Planta lignosa 0·6–1·3 m. alta; rami laxe foliati, flexuosi, purpurei, glabri, demum leviter verrucosi. *Folia* sessilia, oblique lanceolata vel anguste lanceolata, subacuta, basi cuneata, 7–15 cm. longa, 1·5–4 cm. lata, rigide coriacea, glabra, utrinque laxe reticulata; nervi laterales utrinsecus circiter 10, prominuli,

Fig. 10. *Protea argyrophaea*, Hutchinson. 1, leaf; 2, trifid perianth-limb; 3, free perianth-limb; 4, anther; 5, pistil.

marginem versus multe ramosi, linea intramarginalem formantes. *Capitula* terminalia, solitaria, circiter 6 cm. longa et 5 cm. diametro. *Involucri bracteae* 9–10 -seriatae, exteriores parvae, ovato-triangulares, circiter 3 mm. longae, intermediae late oblongo-ovatae, 3 cm. longae, parce appresse lanatae, interiores spathulato-oblongae, fere 6 cm. longae, apice rotundatae et ciliatae, dorso appresse sericeae. *Flores* albi. *Perianthium* 4 cm. longum, ad basin bipartitum, segmentis 3 connatis, limbo 1·3 cm.

longo apice trilobato, lobis lateralibus molliter pilosis intermediis glabris, segmento libero limbo lineari-lanceolato acuto superne glabro. *Antherae* circiter 6 mm. longae. *Ovarium* dense ferrugineo-villosum, stylo 3·5 cm. longo glabro 5 mm. infra apicem minute geniculato.

Northern Nigeria. Plains between Hepham and Ropp, 4600 ft., 5 July, 1921, 2–4 ft. high, flowers white, odour very strong, *H. V. Lely* No. 381.

The specific name refers to the silvery sheen on the intermediate bracts, which is conspicuous according to the amount and direction of light.

Thymelaeaceae.

Gnidia Schweinfurthii, *Gilg ;* F.T.A. vi. i. 219.

Naraguta, 18 ins. high, flowers yellow, No. 76.

Distrib.—Northern Nigeria to Bongoland.

Lasiosiphon Kraussii, *Meisn. ;* F.T.A. vi. i. 231.

Naraguta, 1 ft. high, flowers yellow, Nos. 11 and 13.

Arthrosolen chrysantha, *Solms.-Laub. ;* F.T.A. vi. i. 234.

Naraguta, 12 ins. high, flowers yellow, No. 79.

Distrib.—From Northern Nigeria southwards over nearly all Tropical Africa.

Loranthaceae.

Loranthus dodoneaefolius, *DC. ;* F.T.A. vi. i. 341.

Naraguta, 5 Aug., a parasite 2–3 ft. high on *Parkia filicoidea*, flowers deep red, No. 498.

Distrib.—Senegambia to Uganda.

Santalaceae.

Thesium leucanthum, *Gilg ;* F.T.A. vi. i. 420.

Naraguta, 18 ins. high, flowers yellow, No. 66.

Distrib.—Hitherto known only from Angola; a very distinct species with remarkably long perianth; the plants from the two areas do not seem to be separable.

Thesium viride, *A. W. Hill*, var. **pubescens,** *Hutch.* in *Kew Bull.* 1921, 253.

Naraguta, in clumps 8 ins. high, flowers brown or yellow, No. 5.

Distrib.—Type form also in the Cameroons.

Euphorbiaceae.

Euphorbia convolvuloides, *Hochst. ;* F.T.A. vi. i. 495.

Rinjim Mukr, 2500 ft., 6–12 ins. high, minute red flowers, No. 222.

Distrib.—North and East Tropical Africa.

Euphorbia hirta, *Linn. ;* F.T.A. vi. i. 496.

Naraguta, 6 ins. high, flowers green, No. 34.

Euphorbia hypericifolia, *Linn.;* F.T.A. vi. i. 498.
Takwara, 3200 ft., 4 May, 6 ins. high, minute red flowers, No. 115.

Phyllanthus capillaris, *Schum. & Thonn.;* F.T.A. vi. i. 709.
Plains between Hepham and Ropp, 4600 ft., 5 July, 3 ft. high, woody, flowers white, minute, No. 371.

Phyllanthus pentandrus, *Schum. & Thonn.;* F.T.A. vi. i. 710.
Lemme, 2600 ft., 7 May, 12 ins. high, minute green flowers, No. 139.

Fluggea microcarpa, *Bl.;* F.T.A. vi. i. 736.
Panyam, 4500 ft., 11 July, 3 ft. high, greenish white flowers, No. 418.

Croton lobatus *Linn;* F.T.A. vi, i. 750.
Lemme, 2600 ft., 7 May, 1–2 ft. high, petals minute, pale pink, No. 134. Vodni, 4600 ft. 13th July, No 429.

Chrozophora senegalensis, *A. Juss;* F.T.A. vi, i. 837.
Lemme, 2600 ft., 7 May, 6–12 ins. high, flowers minute, red, No. 133.
Distrib.—Upper Guinea to North Central Africa.

Acalypha senensis, *Klotzsch,* var. **chariensis,** *Hutch.;* F.T.A. vi. i. 889.
Panyam, 4500 ft., 17 July, 2 ft. high, male flower with pink calyx and white stamens, female with 3 bright red hairy styles, No. 412.

Acalypha ornata, *Hochst.;* F.T.A. vi. i. 890.
Tilde Filani, 3300 ft., 24 May, 6–8 ft. high, spikes of reddish flowers in sticky bracts, No. 230.

Acalypha crenata, *Hochst.;* F.T.A. vi. i. 903.
Nabardo, 2300 ft., 20 May, No. 214.
Distrib.—N. Nigeria to Abyssinia and Somaliland.

Tragia spathulata, *Benth.;* F.T.A. vi. i. 971.
Neill's Valley, 2 miles east of Naraguta Government Station, 15 June, climbing, in tangled masses, with stinging hairs, flowers greenish, No. 265.
Distrib.—Upper Guinea.

Urticaceae.

Trema guineensis, *Ficalho;* F.T.A.
Naraguta, 4000 ft., 30 June, woody, 2 ft. high, flowers and fruits green, No. 340.

Hydrocharidaceae.

Ottelia lancifolia, *A. Rich.;* F.T.A. vii. 7.
Naraguta, 8 Aug., an aquatic in mud on bottom of small pools in running water, whole plant sometimes blooming entirely under water, sometimes the corolla on the surface, flowers yellow, No. 509.

ORCHIDACEAE.

Eulophia guineensis, *Lindl.;* F.T.A. vii. 69.

Tilde Filani, 3300 ft., on stream bank in dark places, 24 May, 2–3 ft. high, sepals greenish-purple, lip pale mauve, No. 232.

Distrib.—North and West Tropical Africa.

Eulophia propinqua, *Hutchinson*, sp. nov., affinis *E. Shupangae*, Kränzl., sed foliis angustioribus bracteis brevioribus, labelli lobo medio minore et integro differt.

Herba erecta, 0·75 m. alta. *Folia* elongato-lineari-lanceolata, acuta, basin versus longe attenuata, usque ad 45 cm. longa, circiter 1 cm. lata, multinervia, glabra. *Scapi* elongati, vaginis 4 cm. distantibus striatis stramineis dense induti; racemi 4–5 cm. longi, circiter 12–15-flori; bracteae lineari-lanceolatae ad ovato-lanceolatae, acute acuminatae, inferiores 2 cm. superiores 0·5 cm. longae, fere membranaceae, glabrae; pedicelli ad 7 mm. longi. *Flores* flavi, purpureo striati, labio rubro maculati. *Sepala* et petala subaequalia, ovato-lanceolata, acuta, circiter 1 cm. longa et 6–7 mm. lata, striata. *Labellum* 8 mm. longum, 5 mm. latum, trilobum, lobis lateralibus oblongo-lanceolatis apice rotundatis 2–3 mm. longis, intermedio late oblongo apice rotundato 4·5 mm. longo supra dense et acute verrucoso. *Calcar* distinctum, 1·25 mm. longum. *Columna* 6 mm. longa, oblongo-linearia.

NORTHERN NIGERIA. Plains between Hepham and Ropp, 4600 ft., 5 July, bright yellow terrestrial orchid 2 ft., "hood" with purple lines, lip spotted red, *H. V. Lely* No. 353.

Superficially this new species closely resembles the genus *Pteroglossaspis*, but the presence of a short spur excludes it from this genus. Its affinity in *Eulophia* is clearly with *E. Shupangae*, Kränzl., an East Tropical African species, from which it differs in the characters noted in the description above.

Lissochilus Heudelotii, *Reichb. f.;* F.T.A. vii. 80.

Naraguta, 4 ft. high, lip deep purple with green wings, remainder of the flower pale mauve pink, No. 81.

Distrib.—Senegambia to Northern Nigeria.

Lissochilus arenarius, *Lindl.;* F.T.A. vii. 82.

Zaranda Filani, 19 May, flowers pale purple, No. 199.

Angraecum Kotschyanum, *Reichb. f.;* F.T.A. vii. 137.

Neill's Valley, 2 miles east of the Government Station, Naraguta, 15 June, growing on *Ficus* and *Diospyros*, racemes 3, the longest 22 inches in the axil of the lowermost leaf, the other two from below the leaves, spur 9–10 inches long, flesh pink, flowers white, No. 272.

Distrib.—This is the first gathering from Upper Guinea; recorded previously from East Tropical Africa, from Senaar to the River Shire, Nyasaland.

Pogonia umbrosa, *Rchb. f.;* F.T.A. vii. 186.

Zelau, 3200 ft., 25 Apr., root tuberous, flowers green with 2 purple lines inside the lip, No. 117.

Distrib.—West Trop. Africa from Sierra Leone to Angola.

Satyrium nigericum, *Hutchinson*, sp. nov.; affinis *S. Carsoni*, Rolfe, sed inflorescentia densiflora, floribus minoribus, calcaribus brevioribus differt.

Herba terrestris, erecta, circiter 35 cm. alta. *Folia* basalia geminata, patula, orbiculata, circiter 3 cm. longa et fere 5 cm. lata, tenuiter chartacea, multinervia, glabra; folia caulina ad vaginas 3·5–4 cm. longas reducta. *Inflorescentia* 4–5 cm. longa, densiflora, conspicue bracteata; bracteae obovatae, apice rotundatae, 1·5–2 cm. longae, usque ad 1·3 cm. latae, fere membranaceae, circiter 10-nerviae, glabrae. *Flores* albi. *Sepala* circiter 1 cm. longa, dorsale oblanceolato apice rotundato 2 mm. lato, lateralibus oblique oblongo-ellipticis late emarginato 4 mm. latis. *Petala* sepalo dorsale similia. *Labellum* superum, 1 cm. longum, cucullatum, supra carinatum, in calcaribus duobus subacutis circiter 7 mm. longis productum. *Columna* curvata, 5 mm. longa, apice complanato-rotundata. *Ovarium* alatum, 5–7 mm. longum.

Northern Nigeria. Plain between Bukuru and Hepham, 4300 ft., 4 July, 1921, flowers pure white, with double spurs, ovary winged, *H. V. Lely* No. 344.

Brachycorythis pubescens, *Harv.;* F.T.A. vii. 201.

Naraguta, 4000 ft., 30 May, 2 ft. high, spikes 1 ft. long, flowers purple, No. 237.

Distrib.—Hitherto unknown from Upper Guinea; previously recorded from Kenya Colony to the Transvaal and Natal and in Angola.

Habenaria zambesina, *Reichb. f.;* F.T.A. vii. 211.

Mongu, 4300 ft., 10 July, spike 3–4 inch, flowers white, No. 405.

Naraguta, in grass of open park country, 22 July. Hausa name "Rumana," No. 461.

Habenaria Mannii, *Hk. f.;* F.T.A. vii. 225.

Naraguta and Jos, 4 Sept., handsome green terrestrial orchid about 15 ins. high, No. 560.

Distrib.—Known hitherto only from the Cameroon Mt., where it occurs between 5000–9000 ft. altitude; the bracts of the Nigerian specimen are rather larger and the plant more robust than the Cameroon examples, but I do not think there is a specific difference.

Scitamineae.

Cadalvena Dalzielii, *C. H. Wright* in *Kew Bull.* 1912, 195.

Top of Zaranda Mt., in water course on slopes, 5800 ft., 18 May, leaves four, flower yellow to orange, No. 198;

common also in Zaria and in large numbers at Tilde Filani and Naraguta.

Distrib.—Apparently endemic; according to Dalziel it occurs all over Northern Nigeria except in the north; Hausa "Takalmin zomo" = hare's slipper. A very beautiful species worthy of cultivation.

Iridaceae.

Aristea angolensis, *Baker;* F.T.A. vii. 347.

Plains between Bukuru and Hepham, 4300 ft., 4 July, 1–2 ft. high, flowers bright blue, No. 342.

Distrib.—Known hitherto only from Angola.

Lapeyrousia montana, *Hutchinson*, sp. nov.; affinis *L. Sandersonii*, Baker, species transvaalensis, sed perianthii tubo multo breviore differt.

Herba glabra, circiter 30 cm. lata, superne laxe ramosa; caulis sulcatus, flexuosus, basin versus circiter 2·5 mm. crassus. *Folia* pauca (2–3), linearia, acuta, 10–15 cm. longa, 1·5–2·5 mm. lata, rigida, trinervia. *Inflorescentia* laxe cymosa, ramis pauciflorus flexuosis; bracteae lanceolato-ovatae, acutae, circiter 7 mm. longae, membranaceae, apicem versus coloratae. *Perianthium* coeruleum; tubus 1 cm. longus, inferne cylindricus, superne sensim expansus; lobi unguiculati, oblanceolati, acute apiculati, 1 cm. longi, circiter 4 mm. lati, striati. *Stamina* perianthii segmentis breviora; filamenta 4 mm. longa; antherae 4 mm. longae, obtusae. *Stylus* staminibus paullo longior, ramis 1·75 mm. longis apice bifidis. *Ovarium* late ellipsoideum, 2·5 mm. longum.

Northern Nigeria. Top of Zaranda Mt., 5800 ft., 18 May, 1921, 1–1½ ft. high, flowers blue, with dark purple spot at base of tube, *H. V. Lely* No. 189. Neill's Valley, 2 miles east of Government Station, Naraguta, June 15, No. 271.

Gladiolus spicatus, *Klatt.;* F.T.A. vii. 369.

Plains between Hepham and Ropp, 4600 ft., 5 July, 9–24 ins. high, flowers red-purple, No. 357.

Distrib.—Endemic to Northern Nigeria.

Gladiolus Quartinianus, *A. Rich.;* F.T.A. vii. 371.

Neill's Valley, 2 miles east of Naraguta Government Station, rocky places, 15 June, flowers orange spotted and streaked, No. 256. Naraguta, 4000 ft., open grass country, 30 May, flowers yellow green, No. 244; this number probably represents the form described by Baker as *G. primulinus*, later merged by him in *G. Quartinianus*.

Gladiolus unguiculatus, *Baker;* F.T.A. vii. 372.

Baradau, 3000 ft., 3 May, 2–3 ft. high, flowers pink and white, No. 97.

Distrib.—Sierra Leone to Eastern Sudan and Nyasaland.

Hypoxis angustifolia, *Lam.;* F.T.A. vii. 378; Nel in Engl. Bot. Jahrb. lxi. 305.

Top of Zaranda Mt., 5800 ft., 18 May, flowers bright yellow, No. 193.

Crinum yuccaeflorum, *Salisb.;* F.T.A. vii. 399.

Bichikki, 2200 ft., 17 May, leaves 12–18 ins., perianth white with purple middle line, No. 182.

Nabardo, 20 May, No. 202.

Distrib.—West Tropical Africa.

Mr. Lely notes a difference in his plants numbered 182 and 202. The former he never found with more than 2 flowers in each head, the latter with 8 flowers, and a much more robust plant than No. 182. There is probably considerable variation in the number of flowers to each umbel.

Taccaceae.

Tacca pinnatifida, *Forst.;* F.T.A. vii. 413.

Nabardo, 2300 ft., 20 May, 3 ft. high, leaf appearing first, wrapped in a strong sheath about 8 ins. long, marked like a snake-skin pale green with brown purple pattern, the sheath completely cast off on maturity, flowers white, No. 209.

Dioscoreaceae.

Dioscorea Beccariana, *Martelli;* F.T.A. vii. 420.

Naraguta, 4000 ft., 30 May, climbing, No. 246.

Liliaceae.

Asparagus Pauli-Guilelmi, *Solms;* F.T.A. vii. 428.

Naraguta, flowers white, No. 12.

Zelau, 3200 ft., 25 Apr., 1–2 ft. high, No. 119.

Asparagus africanus, *Lam.;* F.T.A. vii. 433.

Nabardo, 2300 ft., 20 May, delicate small spined plant 1–3 ft. high with white flowers, No. 204.

Aloe Barteri, *Baker;* F.T.A. vii. 464.

Pankshin, 5100 ft., 14 July, 3 ft. high, leaves dark green with very occasional pale green spots, flowers pale brick red, No. 433.

Distrib.—Togoland to the Ubangui.

Anthericum triflorum, *Ait.;* F.T.A. vii. 493.

Neill's Valley, 2 miles east of the Government Station, Naraguta, 15 June, on rocks near water, flowers white, sweet-scented, No. 258.

Chlorophytum blepharophyllum, *Schweinf.;* F.T.A. vii. 501.

Zelau, 3200 ft., near streams, roots fleshy, not bulbous, 1 ft. high, flowers dull brown, No. 113.

Naraguta, 4000 ft., 30 May, No. 245.

Distrib.—North and East Tropical Africa.

Chlorophytum pusillum, *Schweinf.;* F.T.A. vii. 502.
Naraguta, 4000 ft., prostrate, forming a thick mat on the ground, flowers white, No. 248.
Distrib.—Also in Jurland.

Dipcadi longifolium, *Baker;* F.T.A. vii. 519.
Takwara, 3200 ft., 1–3 ft., flowers loose, green, No. 118.
Distrib.—Upper Guinea and South East Trop. Africa.

Urginia nigritana, *Baker;* F.T.A. vii. 542.
Bukuru, 20 July, 18 ins. high, flowers green, No. 460
Distrib.—Northern Nigeria to Uganda.

Gloriosa virescens, *Lindl.;* F.T.A. vii. 563.
Nabardo, 2300 ft., 20 May, near streams, 1–4 ft. high, perianth-segments dark red, edged with bright yellow, green at the base, No. 211.

Xyridaceae.

Xyris Barteri, *N. E. Brown;* F.T.A. viii. 22.
Naraguta, 20 June, boggy places, 6–9 ins. high, No. 282.
Distrib.—Northern Nigeria to the Upper Chari.

Commelinaceae.

Commelina nudiflora, *Linn.;* F.T.A. viii. 36.
Zelau, 3200 ft., 25 Apr., decumbent and upright in wet places, flowers blue, No. 116.

Aneilema sinicum, *Lindl.;* F.T.A. viii. 63.
Mongu, 4300 ft., 10 July, 1–2 ft. high, flowers violet, opening in the evening, No. 406.

Aneilema soudanicum, *C. B. Clarke;* F.T.A. viii. 71.
Lemme, 2600 ft., 1–2 ft. high, No. 138.
Distrib.—Nigeria and Cameroons to Abyssinia.

Cyanotis lanata, *Benth.;* F.T.A. viii. 80.
Naraguta, 20 June, 12 ins. high, succulent plant, leaves and stem with long tangled cottony hairs, petals mauve, filaments with purple hairs, No. 280.
Plains between Hepham and Ropp, 4600 ft., 5 July, No. 382.

Floscopa flavida, *C. B. Clarke;* F.T.A. viii. 87.
Naraguta, 27 Aug., tiny herb 2–3 ins. high growing on wet rocks, flowers mauve and cream, No. 554.
Distrib.—Also in Jurland, Nyasaland and at the Victoria Falls.

There are several more species of *Commelinaceae* in the collection which I have not been able to determine satisfactorily.

Araceae.

Amorphophallus Barteri, *N. E. Br.;* F.T.A. viii. 151.
Mamu, 2500 ft., 11 May, in dark crevices under overhanging rocks in rich soil, 1 ft. high, spathe dark purple, male

flowers brick-red, females green with purple stigma, pungent odour. Hausa name "Kunnen Jaki" (Donkey's ear), root supposed cure for delayed childbirth, No. 159.
Distrib.—Endemic to Northern Nigeria.

Cyperaceae.

Pycreus flavescens, *Reichb.;* F.T.A. viii. 290.
Naraguta, 4000 ft., 1 ft. high, No. 96.
This and most of the remainder of the Monocotyledons here enumerated are widely spread in Tropical Africa.

Cyperus compactus, *Lam.;* F.T.A. viii. 319.
Lemme, 2600 ft., 18 ins. high, white sweet scented sedge No. 148.

Cyperus amabilis, *Vahl;* F.T.A. viii. 327.
Naraguta, 4000 ft., 15 Apr., 1 ft. high, No. 95.

Cyperus Haspan, *Linn.;* F.T.A. viii. 332.
Lemme, 7 May, 2 ft. high, No. 154.

Cyperus distans, *Linn.;* F.T.A. viii. 349.
Naraguta, 23 June, 12–18 ins. high, No. 329.

Cyperus esculentus, *Linn.;* F.T.A. viii. 355.
Lemme, 2600 ft., 7 May, 12 ins. high, No. 149.

Cyperus exaltatus, var. **dives,** *Delile;* F.T.A. viii. 370.
Nabardo, 25th May, 4–6 ft. high, No. 203.

Mariscus umbellatus, *Vahl;* F.T.A. viii. 390.
Taura, 6 May, 18 ins. high, No. 123.
Jira, 2 May, No. 129.

Fimbristylis diphylla, *; Vahl* F.T.A. viii. 415.
Lemme, 7 May, 2½ ft. high, No. 153.

Fimbristylis monostachya, *Vahl;* F.T.A. viii. 424.
Rinjim Mukr, 2500 ft., 22 May, 6 ins. high, No. 221.

Fuirena umbellata, *Rotb.;* F.T.A. viii. 466.
Naraguta, 8 Aug., 2–3 ft., in grasslands, No. 516.

Lipocarpha albiceps, *Ridley;* F.T.A. viii. 471.
Baradau, 3000 ft., 3 May, 1 ft. high, heads white, No. 98.

Ascolepsis protea, var. **bellidiflora,** *Welw.;* F.T.A. viii. 474.
Panyam, 4500 ft., 11 July, 6–8 ins. high, flowers white, No. 411.

Eriospora pilosa, *Benth.;* F.T.A. viii. 512.
Top of Zaranda Mt., 18 May, No. 197.
Distrib.—Upper Guinea.

Gramineae.

Manisuris granularis, *Sw.;* F.T.A. ix. 57.
Naraguta, 1 Aug., 1–2 ft. high, local, No. 477.

Hypharrenia rufa, *Stapf;* F.T.A. ix. 304.
Naraguta, 20 June, No. 292.

Alloteropsis semialata, *Hitchc.*
Top. of Zaranda Mt., 5800 ft., 18 May, No. 195.

Brachiaria fulva, *Stapf.;* F.T.A. ix. 518.
Naraguta, 20 June, No. 289.

Paspalum scrobiculatum, var. **polystachyum,** *Stapf;* F.T.A. ix. 576.
Naraguta, 23 June, No. 332.

Sacciolepis interrupta, *Stapf;* F.T.A. ix. 757.
Naraguta, 23 June, No. 327.

Setaria aurea, *A. Br.*
Naraguta, 20 June, No. 291.

Setaria barbata, *Kunth.*
Naraguta, 21 June, No. 298.

Tricholaena rosea, *Nees.*
Naraguta, 21 June, No. 295.

Pennisetum polystachyum, *Kunth.*
Naraguta, 20 June, No. 290.

Sporobolus festivus, *Hochst.*
Naraguta, 21 June, No. 296.

Eragrostis megastachya, *Link.*
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Naraguta, on river banks and amongst rocks, 15 June, No. 304.

Anemia Schimperiana, *Presl.;* Hook. & Bak. Synop. Fil. 434.
Naraguta, as above, No. 307.

Cheilanthes Schimperi, *Knze.;* Hook. & Bak. l.c. 133.
Naraguta, as above, No. 303.
Distrib.—East Africa from Abyssinia to Rhodesia.

Cheilanthes farinosa, *Kaulf.;* Hook. & Bak. l.c. 142.
Naraguta, as above, No. 305.

Nephrolepis cordifolia, *Presl.;* Hook. & Bak. l.c. 300.
Naraguta, as above Nos. 301 and 309.

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XLVII.—MISCELLANEOUS NOTES.

William Purdom.—We regret to learn, through Mr. C. H. Hough, of Ambleside, that Mr. W. Purdom died suddenly at Pekin on November 7th, 1921. He will long be remembered as one of the intrepid band of collectors, including Henry, Wilson, Forrest, Farrer and Meyer, who explored China in the interests of botany and horticulture during the early years of the twentieth century. He was born at Heversham, in Westmorland, April 10th, 1880, and after several years' training at Brathay Hall Gardens, Messrs. Low & Sons, of Enfield, and Messrs. Veitch at Coombe Wood, came to Kew in August, 1902, leaving in December, 1908. He was then engaged by Messrs. Veitch and Harvard University as plant collector in China, chiefly in the province of Kansu. Subsequently he joined the late Mr. Reginald Farrer as travelling companion in the same region. Their joint adventures are recorded in Mr. Farrer's "Eaves of the World," and "The Rainbow Bridge." Mr. Farrer always wrote and spoke of Purdom in terms of admiration and affection, and he dedicated the first book to "my dear Bill"—an "absolutely perfect friend and "helper, through whom alone it was that these odysseys were "made possible and pleasant." In 1917 he was appointed to be head of one of the five Departments of Forestry maintained by the Chinese Government. During the last four years he has established nurseries in various parts of Honan in furtherance of large schemes of reafforestation in the north of China. He has also had much to do with the railways, and with the supply of timber from native sources.

Index Kewensis, Supplement V.*—The appearance of the fifth supplement to the Index Kewensis continues that work to the end of the year 1915. Compared with the three preceding quinquennial supplements, the one just issued exhibits a considerable increase in size, containing 277 pages as against 204, 193 and 252 respectively in the second, third and fourth supplements. The geographical distribution of new species is now given in greater detail; in the case of new combinations only the synonym is given. It may be well to call attention to the fact that this supplement—like the last—is a register of names without any reductions, no opinion being expressed as to the validity of the genera and species contained in it. Numerous names accidentally omitted from previous supplements are included, and others are re-inserted in cases where the reference originally given was not the earliest.

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* Index Kewensis Plantarum Phanerogamarum Supplementum Quintum nomina et synonyma omnium generum et specierum ab initio anni MDCCCCXI usque ad finem anni MDCCCCXV nonnulla etiam antea edita complectens ductu et consilio D. Prain confecerunt Herbarii Horti Regii Botanici Kewensis Curatores. Oxonii e prelo Clarendoniano MDCCCCXXI.

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